REPORT OF THE WORKING GROUP ON INCIDENTAL MORTALITY ASSOCIATED WITH FISHING

(This text was adopted as part of the WG-FSA report and has been extracted here as a separate document)

INCIDENTAL MORTALITY ARISING FROM LONGLINE FISHING

Intersessional Work of Ad Hoc WG-IMALF

7.1 The Secretariat reported on the intersessional activities of ad hoc WG-IMALF (WG-FSA-00/5 Rev. 1) according to the agreed plan of intersessional activities for 1999/2000 (SC-CAMLR-XVIII, Annex 5, Appendix D). The report contained records of all activities planned and their results. These were reviewed and appropriate details appear in the 2000/01 plan of intersessional activities of WG-IMALF (Appendix D).

7.2 The Working Group noted the extensive work accomplished intersessionally by ad hoc WG-IMALF, details of which were presented in a number of WG-FSA papers. In general, the group concluded that most tasks planned for 1999/2000 had been successfully implemented. The Working Group thanked the Science Officer for his work on the coordination of IMALF activities. It also thanked the Scientific Observer Data Analyst for his work on the processing and analysis of data submitted to the Secretariat by international and national observers during the course of the 1999/2000 fishing season.

7.3 Of concern was the limited feedback received this year from some technical coordinators on IMALF-related matters. All technical coordinators are urged to respond to requests from WG-IMALF, even if they are unable to report progress.

7.4 The membership of WG-IMALF was reviewed and a number of modifications and additions suggested; the group noted that some CCAMLR Member countries which are involved in longline fishing and/or seabird research in the Convention Area (e.g. European Community, Ukraine, Uruguay and the USA) are not represented on ad hoc WG-IMALF. The Working Group indicated that Dr A. Stagi (Uruguay) and Dr K. Rivera (USA) would be welcome additions to its membership. The attendance at this year's meeting of a representative from Brazil was particularly appreciated; the absence of a representative from France was particularly regretted. Members were asked to review their representation on ad hoc WG-IMALF intersessionally and to facilitate attendance of as many representatives as possible at the meeting.

Research into the Status of Seabirds at Risk

7.5 In response to requests for updates on information summarising national research on seabirds (albatrosses and *Macronectes* and *Procellaria* petrels) vulnerable to longline fisheries interactions, papers were presented by the UK (WG-FSA-00/8), France (WG-FSA-00/9), New Zealand (WG-FSA-00/10) and Australia (WG-FSA-00/49). Reference to research on albatrosses in Chile is included in both WG-FSA-00/8 and 00/49. Of the countries known to be conducting relevant research on these species, no reports to IMALF were received from Argentina, South Africa and the USA. These Members were requested to table information on the current status of these research programs for next year's meeting of WG-FSA. All Members were requested to update regularly information relating to their programs.

7.6 The reports provided were summarised in Table 47, which updates Table 45 in SC-CAMLR-XVIII, Annex 5.

7.7 Essentially, no research programs focusing on relevant seabird populations have been initiated since 1999. Consequently the deficiencies resulting from the lack of relevant research on population dynamics and foraging ecology of most populations remain (SC-CAMLR-XVIII, Annex V, paragraph 7.10). Specifically the urgent requirement for research on the species and populations described in SC-CAMLR-XVIII, Annex V, paragraphs 7.11 to 7.15 remains.

7.8 Prof. Croxall reported that although the directed research program on white-chinned petrels at South Georgia had concluded, the population assessment project had demonstrated a 28% decline in the breeding population over the last 20 years and concluded that, as this could not be attributed to habit modification caused by fur seal activities on land, the likely causes were in the marine environment (Berrow et al., 2000). Full details of this work, which provide a sound baseline for future population monitoring, would be presented at next year's meeting.

7.9 The Working Group recollected that the main reasons for requesting the data summarised in Table 47 were to enable assessment of the availability of data on:

(i) size and trends of populations of albatross species and of *Macronectes* and *Procellaria* petrel species vulnerable to interactions with longline fisheries; and

(ii) the foraging ranges of populations of these species, at different times of year and stages of the breeding cycle, adequate to assess overlap with areas used by longline fisheries and, ideally, to compare at-sea distributions with data on fishing effort.

7.10 From the information summarising current population research provided in Table 47, it remains impossible to determine the adequacy of these data for assessing population trends and providing critical data on population dynamics. Therefore, Members are requested to report in more detail on their seabird research programs, specifically to provide information on the years in which population estimates have been obtained and in which demographic variables (productivity, adult survival and recruitment) have been measured. A similar request should be made to the SCAR Secretariat to obtain relevant information from SCAR members.

7.11 Similarly, Members are requested to provide more detail on their studies to determine foraging range by indicating the year of study, the number of individuals tracked, the breeding stage of study birds and the CCAMLR statistical subareas and divisions frequented by these birds. This information will assist in delineating foraging ranges as well as assisting the assessments of regional risk of seabird by-catch.

7.12 Last year the Working Group had requested information from Members on genetic research relevant to determining the provenance of birds killed in longline fisheries.

7.13 The UK had briefly summarised in WG-FSA-00/7 the species and sites studied in some recent research. Prof. Croxall indicated that this work revealed a limited ability to determine the source populations of black-browed and wandering albatrosses but, at present, no ability to achieve any discrimination between grey-headed albatross populations. More details of this work should be available for presentation at next year's meeting.

7.14 Complementary studies of other species and populations are known to be previously or currently undertaken by Australia, New Zealand, USA and South Africa. Members are requested to provide and update information on the current status of these research programs for next year's meeting of WG-FSA. Additional information detailing the number of samples analysed from each population, as well as the agency responsible for the curation of samples, would be sought.

7.15 The requests outlined in paragraphs 7.10, 7.11 and 7.14 should also be made to the SCAR Secretariat to solicit relevant information from their members.

7.16 The Working Group drew attention to WG-FSA-00/34 which summarised the global status of albatrosses and *Macronectes* and *Procellaria* petrels, as assessed using the IUCN threatened species criteria. The latest IUCN Red List, which contains these assessments, was published in September 2000; the full texts of all these assessments are in BirdLife International (2000), published in October 2000.

7.17 These new category assessments have been incorporated into Table 47, replacing the earlier assessments in Croxall and Gales (1998).

7.18 Of particular concern, in relation to CCAMLR, are those species, identified in WG-FSA-00/34, where the categorisation is based on criteria involving population decline, either solely, or in combination with small range and/or small population size. In most, if not all, such cases, the main cause of decline is known, or inferred, to be incidental mortality associated with longline fishing (BirdLife International, 2000).

7.19 The Working Group noted that WG-EMM-00/16 contained analyses of time-series data of breeding population counts of various albatross and petrel species and populations, viz:

Wandering albatross	*Diomedea exulans*	South Georgia Kerguelen Marion (Prince Edward Islands) Possession (Crozet Islands)
Amsterdam albatross	*Diomedea amsterdamensis*	Amsterdam
Black-browed albatross	*Diomedea melanophrys*	South Georgia Kerguelen
Indian yellow-nosed albatross	*Diomedea chlororhynchos*	Amsterdam Gough
Grey-headed albatross	*Diomedea chrysostoma*	South Georgia Marion
Sooty albatross	*Phoebetria fusca*	Possession
Light-mantled albatross	*Phoebetria palpebrata*	Possession
Southern giant petrel	*Macronectes giganteus*	Marion Possession Mawson Davis Casey
Northern giant petrel	*Macronectes halli*	Marion Possession

These data, and analyses, are of considerable potential relevance to the investigations of the Working Group referred to in paragraphs 7.5 to 7.9.

7.20 The Working Group noted that the report of the Workshop on Albatross and Petrel Mortality from Longline Fishing held in Hawaii, USA, in May 2000 (SC-CAMLR-XIX/BG/12), called for enhanced effective monitoring of seabird population trends (including structure and dynamics) and enhanced research into foraging ecology. The workshop also concluded that it was vital to maintain and sustain existing long-term population studies since these are unique sources from which to identify problems, disentangle potentially confounding causal effects and monitor progress towards management targets, including success of remedial measures. Wherever possible, these studies should be designed so as to accompany estimates of population size and trends with other demographic data, especially annual adult survival and recruitment rates. The Working Group endorsed these conclusions.

7.21 The Working Group noted a comment from the Scientific Committee (SC-CAMLR-XVIII, paragraph 4.76(iv)(d)), apparently requesting advice from WG-IMALF on 'appropriate levels of by-catch, on an area-specific basis'.

7.22 Given the lack of detail accompanying this request, and the complexity, both philosophical and practical, of undertaking relevant analyses, the Working Group deferred consideration of this topic.

7.23 It noted, however, that this subject would be extensively discussed at the forthcoming International Fishers' Forum meeting (see paragraphs 7.179 to 7.181). Several members of WG-IMALF would be attending and it was hoped that WG-IMALF would be in a position to discuss this topic next year.

Incidental Mortality of Seabirds during Regulated
Longline Fishing in the Convention Area

2000 Data

7.24 Data were available from 35 longline cruises conducted within the Convention Area during the 1999/2000 season (for details see WG-FSA-00/37 and paragraphs 3.35 to 3.38 and Table 9).

7.25 The Working Group expressed concern, as they did last year (SC-CAMLR-XVIII, Annex 5, paragraph 7.31), that the proportion of hooks being observed to provide overall estimates of seabird mortality was still rather low (WG-FSA-00/37 and Table 48). The Working Group was concerned to note that on seven trips the proportion of hooks observed was less than 20%. A desirable level of observation would be about 40–50% (SC-CAMLR-XVII, Annex 5, paragraphs 3.60 and 7.124 to 7.130); levels below 20% may introduce potentially serious errors into estimates (SC-CAMLR-XVIII, Annex 5, paragraph 7.31; paragraph 3.48).

7.26 The Working Group noted, however, that for vessels with single observers it could be very difficult to achieve observation of a higher proportion of hooks without potentially compromising other duties (paragraph 3.51).

7.27 This problem was compounded this year by the fact that a disproportionate amount of the observed seabird by-catch was reported on vessel cruises with low proportions of hooks observed (e.g. Subareas 58.6/58.7: *Aquatic Pioneer* cruise 3 (10%); *Eldfisk* Cruise 3 (17%); *Koryo Maru 11* cruise 2 (27%)).

7.28 The average proportion of hooks observed (percentages with ranges in parenthesis) over the last four years, for Subareas 48.3, 58.6/58.7 and 88.1 has been as follows:

1997: 48.3 – 34 (5–100); 58.6/58.7 – 60 (15–100);
1998: 48.3 – 24 (1–57); 58.6/58.7 – 43 (14–100);
1999: 48.3 – 25 (10–91); 58.6/58.7 – 34 (13–62); 88.1 – 31 (29–32); and
2000: 48.3 – 24 (11-39); 58.6/58.7 – 42 (10–91); 88.1 – 33 (29–58).

The Working Group understood that the consistently higher values for Subareas 58.6 and 58.7 reflected, at least in part, the use of two observers. The Working Group commended this practice.

7.29 The Working Group expressed disappointment at the continued incorrect reporting of the proportion of hooks observed for seabird by-catch. It was apparent from the data presented that some observers continue to record the number of hooks hauled while they are undertaking biological work, rather than the number of hooks directly observed. For example, in the 2000 data for Subareas 58.6/58.7, the reported value of 91% was found actually to have been 3.7% (Technical Coordinator, South Africa). This problem with the data means that many estimates of seabird by-catch provided to the Working Group are likely to be underestimates.

7.30 The Working Group reiterated (see SC-CAMLR-XVIII, Annex 5, paragraph 7.33) that the level of sampling effort required to estimate seabird mortality should be investigated using existing data and simulation models. This work, which should be undertaken in the intersessional period, should consider the resolution and accuracy of estimates of seabird by-catch rates under various levels of observed by-catch rates.

7.31 The total catch rates were calculated using the total numbers of hooks observed and the total seabird mortality observed (Table 48). No incidental mortality was observed for Subarea 88.1 or Division 58.4.4. The estimated total catch of seabirds by vessel was calculated using the vessel's catch rate multiplied by the total number of hooks set. For those vessels where logbook data for calculating catch rates were unavailable, the catch rate was calculated using the information contained in the observer cruise reports.

Subarea 48.3

7.32 The overall catch rate of birds killed in Subarea 48.3 was 0.0004 birds/thousand hooks; during daylight setting the rate (0.002 birds/thousand hooks) was higher than that for night setting (0.0002 birds/thousand hooks).

7.33 The total estimated seabird mortality in Subarea 48.3 for this season was 21 birds (Table 49), compared with 210 for the previous season. Of the six birds observed killed, half were southern giant petrels (*Macronectes giganteus*); the remainder were equally divided between black-browed albatrosses (*Diomedea melanophrys*), northern giant petrels (*Macronectes halli*) and cape petrels (*Daption capense*) (Table 50).

Subareas 58.6 and 58.7

7.34 For Subareas 58.6 and 58.7, the overall catch rate of birds killed was 0.022 birds/thousand hooks; during daylight setting the rate (0.013 birds/thousand hooks) was significantly lower than that for night setting (0.027 birds/thousand hooks) (Table 51) (see also paragraph 7.41).

7.35 The total estimated seabird mortality in Subareas 58.6 and 58.7 for this season was 516 birds, a three-fold increase compared with the previous season. The white-chinned petrel (*Procellaria aequinoctialis*) was the most commonly observed species killed, comprising 90% of the total seabird mortality (Table 50).

7.36 Further analysis of seabird by-catch in the South African EEZ around the Prince Edward Islands was presented in WG-FSA-00/30. This paper reports on the observer data from 11 fishing trips involving a fishing effort of 7.4 million hooks, up 45% from the 1998/99 season. During 1999/2000, 268 seabirds from six species were reported killed. White-chinned petrels comprised 92% of the total, with smaller numbers of Indian yellow-nosed albatross (*Diomedea chlororhynchos*) and grey-headed albatross (*Diomedea chrysostoma*), grey petrels (*Procellaria cinerea*) and giant petrels.

7.37 The average catch rate was 0.036 birds/thousand hooks, more than double that in 1998/99 (0.016), but considerably lower than the values recorded in either 1997/98 (0.117) or

1996/97 (0.289). By-catch rate varied greatly among trips, but only one trip had a by-catch rate exceeding 0.1 birds/thousand hooks. Just over 2 million hooks were set through the Mustad funnel fitted to the *Eldfisk*, significantly reducing by-catch rates in comparison with daytime sets when the funnel was not in use (see paragraph 7.117). Excluding these sets, the mean by-catch rate was 0.043 birds/thousand hooks (233 birds killed on 5.36 million hooks).

7.38 Seabirds were killed during 134 of 1 748 sets (7.7%), with 68% of birds killed on only 49 sets (2.8%) that had multiple casualties. With the exception of grey petrels (all killed June–September), most birds were caught in summer. The highest by-catch rate was in early summer (October–November) during the pre-laying and early incubation period of white-chinned petrels.

7.39 Time of setting was another important determinant of seabird by-catch. Thus, 21.2% of sets (20.3% of hooks) were set during the day or spanned nautical dawn or dusk. Excluding all underwater sets, the by-catch rate for day sets (0.065 birds/thousand hooks) was almost twice that of night sets (0.038). As was the case in previous years, the seabird by-catch rate showed peaks around dusk and dawn.

7.40 Most fishing effort took place >200 km from the islands. Bird by-catch was greatest between 100 and 200 km from the island due to a peak in white-chinned petrel mortality in this region. Four of the five grey petrels were killed >200 km from the islands, but other species were mostly caught close to the islands (<100 km). The by-catch rate also varied as a function of wind strength. Most birds were killed during sets made at moderate wind speeds (force 4–5). However, the by-catch rate was greatest in calm conditions at night, and at stronger wind speeds during the day.

7.41 The Working Group noted differences between WG-FSA-00/30 and 00/37 in respect of data from Subareas 58.6 and 58.7, which reflected that:

(i) WG-FSA-00/30 included reports of dead birds not directly recorded by the observer, resulting in higher by-catch totals and rates; and

(ii) different definitions of day and night with respect to time of line setting (in WG-FSA-00/37 dusk and dawn was included in daylight, whereas in WG-FSA-00/30 most dusk and dawn periods were included in night time) resulting in different conclusions on by-catch rates in day and night periods.

7.42 Both analyses, however, indicated that:

(i) by-catch levels had increased (over 1999 values) to values similar to those in 1997 and 1998, presumably due to the increased fishing effort;

(ii) by-catch rates had shown no reduction – and possibly even an increase – compared to 1999 values; and

(iii) by-catch rates were still consistently higher than those in Subarea 48.3.

7.43 The differences in by-catch rates between Subarea 48.3 and Subareas 58.6 and 58.7 were clearly attributable to:

(i) vessels in the latter subareas fishing in close proximity to major breeding sites of albatrosses and petrels during their breeding season; and

(ii) poor compliance with night-time setting requirements.

7.44 The Working Group reaffirmed its recommendations from last year (SC-CAMLR-XVIII, Annex 5, paragraph 7.46) that:

(i) reduction in the by-catch rate would likely be achieved by elimination of daytime setting and by line-weighting regimes that comply with Conservation Measure 29/XVI; and

(ii) fishing within 200 n miles of the Prince Edward Islands should be prohibited from January to March inclusive.

7.45 The Working Group expressed regret that, once again, no data on seabird by-catch from fishing operations within the French EEZ in Subarea 58.6 had been submitted to the meeting. It reiterated its request to France to submit such data in order to assist the Working Group in conducting comprehensive evaluations.

Division 58.5.1

7.46 The Working Group expressed regret that, once again, no data on seabird by-catch from fishing operations within the French EEZ in Division 58.5.1 had been submitted to the meeting. It reiterated its request to France to submit such data in order to assist the Working Group in conducting comprehensive evaluations.

Subarea 88.1

7.47 For the third successive season, observers reported no seabird by-catch in association with longline fishing carried out in this subarea by New Zealand (WG-FSA-00/56). The data on seabird species and numbers associated with the fishing vessels, however, emphasised that potential for by-catch exists if mitigating measure requirements were less stringent. This year, in addition to continuing to use streamer lines that met all specifications in Conservation Measure 29/XVI, no offal discharge was made at any time during the cruise, in full compliance with Conservation Measure 190/XVIII. In previous years some offal and by-catch had been stored and discharged only when the vessel was not engaged in fishing activities.

General

7.48 Table 52 summarises data on seabird by-catch and by-catch rates for the last four years (1997–2000) for the best-documented subareas.

7.49 In Subarea 48.3 the total estimated seabird by-catch in 2000 was 10% of that in 1999 and 4% of that in 1997. By-catch rates in 2000 were 0.05% of those in 1997. These changes, achieved in large part by restricting fishing to winter months, but also by improved compliance with Conservation Measure 29/XVI, particularly night setting, have culminated in reducing seabird by-catch in the regulated fishery to negligible levels.

7.50 In Subareas 58.6 and 58.7 the total estimated seabird by-catch in 2000 increased three-fold compared to 1999, reverting to values similar to 1998; the by-catch rate, however, was 27% lower than the 1999 value. The increased by-catch in 2000 is likely due to increased fishing effort, although compliance with Conservation Measure 29/XVI was slightly worse in 2000 than in 1999. By-catch rates in these subareas are unlikely to be reduced further either:

(i) as long as fishing is undertaken during the breeding seasons of the seabird species mainly at risk; or

(ii) until more effective mitigation measures (e.g. fully effective underwater setting and/or line weighting) can be developed and used.

Compliance with Conservation Measure 29/XVI

7.51 Compliance with this conservation measure this year, as set out in WG-FSA-00/38, is summarised in Table 53, in comparison with similar data from previous years.

Streamer Lines

7.52 Compliance with the streamer-line design was poor and only 33% of the streamer lines deployed complied fully with the specifications in Conservation Measure 29/XVI (Table 54). The length of most of the streamer lines was less than 150 m and this continues to be the main reason for the low compliance. All of the streamer lines deployed in Subareas 58.6 and 58.7 and Division 58.4.4 were less than 150 m in length, and only 25% of the lines used in Subarea 48.3 and 67% of the lines in Subarea 88.1 were greater than 150 m in length (but see footnote to Table 53). Some vessels have persistently poor compliance with this element of the conservation measure (e.g. *Aquatic Pioneer*, *Argos Helena*, *Eldfisk*, *Illa de Rua*, *Isla Gorriti*, *Lyn*, *Jacqueline*, *Magallanes III*, *No. 1 Moresko* and *Tierra del Fuego*). Compliance with other elements such as the attached height of the line and the number and spacing of streamers per line remains high (85–100%). Nineteen observers indicated that spare streamer-line material was present on board.

Offal Discharge

7.53 In Subareas 58.6, 58.7 and 88.1 there was 100% compliance with the requirement either to hold offal on board, or to discharge on the opposite side to where the line was hauled. In Subarea 48.3, 76% of the vessels discharged offal on the opposite side to hauling (compared with 71% in 1999); of these vessels 50% did not discharge offal during hauling operations.

7.54 In Subarea 48.3 four vessels (*Faro de Hercules, Isla Sofía, Isla Camila* and *Jacqueline*) are still operating with offal discharge on the same side as the haul, in contravention of Conservation Measure 29/XVI.

Night Setting

7.55 Compliance with night setting has improved in Subarea 48.3 from 80% last season to 92% this season. In Subareas 58.6 and 58.7 compliance fell slightly from 84% to 72% this season. Night setting for the new fishery in Division 58.4.4 was only 50%.

7.56 Vessels which have fished for at least three cruises in two years and consistently failed to comply with this element of the conservation measure include the *Eldfisk, Isla Camila, Isla Gorriti* and *Tierra del Fuego*.

7.57 Fishing in Subarea 88.1 (where only 6% of lines were set at night) operated under Conservation Measure 190/XVIII which contained an exemption from night-setting requirements for vessels south of 65°S in order to conduct line-weighting trials.

Line Weighting

7.58 As in previous years, no vessels complied with line weighting for Spanish longline systems (6 kg every 20 m). The median weight and line spacing for Subareas 48.3, 58.6, 58.7 and Division 58.4.4 was 6 kg every 44 m, 6 kg every 88 m and 5 kg every 45 m respectively.

Thawed Bait

7.59 This year two vessels were reported to have used frozen bait regularly; up to 68% of the lines on the *Aquatic Pioneer* and 34% of the lines on the *RK-1* were set with frozen bait. The Working Group noted that there are technical problems for autoline vessels using fully thawed baits, and that the use of partially thawed baits on autoline vessels was unlikely to adversely affect autoline sink rate.

General

7.60 Details of compliance with streamer line, offal discharge and night-setting requirements of Conservation Measure 29/XVI are summarised on a vessel-specific basis in Table 55. In addition to the persistent compliance failures summarised in paragraphs 7.52, 7.54 and 7.56, this also reveals that several vessels which first entered longline fisheries in the Convention Area in 2000 failed to comply with one (*Faro de Hercules*) or two (*Isla Alegranza* and *Isla Santa Clara*) of these three elements of the conservation measure.

Fishing Seasons

7.61 Last year the Commission decided that the timing of the fishing season for longlining in Divisions 58.4.3, 58.4.4, 58.5.1, 58.5.2 and Subareas 48.3, 48.4 and 58.6 should be changed from 15 April–31 August to 1 May–31 August (CCAMLR-XVIII, paragraph 9.3).

7.62 Only for Subarea 48.3 are sufficient data available to the Working Group to assess the impact this change might have had on seabird by-catch.

7.63 If, in previous years, the fishing season in Subarea 48.3 had opened on 1 May rather than 15 April, then the proportion of mortality occurring at or after the latter date, that would have been avoided, is as follows:

1996 – 71% (58 of 82 birds)
1997 – 43% (103 of 239 birds)
1998 – 23% (18 of 80 birds)
1999 – 36% (21 of 59 birds).

This suggests that the delay in starting the fishing season for longlining in 2000 had a significant beneficial effect on seabird by-catch.

Incidental Mortality of Seabirds during Unregulated Longline Fishing in the Convention Area

Unregulated Seabird By-catch

7.64 As no information is available on seabird by-catch rates from the unregulated fishery, estimates have been made using both the average by-catch rate for all cruises from the appropriate period of the regulated fishery and the highest by-catch rate for any cruise in the regulated fishery for that period. Justification for using the worst by-catch rate from the regulated fishery is that unregulated vessels accept no obligation to set at night, to use streamer lines or to use any other mitigation measure. Therefore by-catch rates, on average, are likely to be considerably higher than in the regulated fishery. For Subarea 48.3, the worst-case by-catch rate was nearly four times the average value and applies only to a single cruise in the regulated fishery. Using this by-catch rate to estimate the seabird by-catch rate of the whole unregulated fishery may produce a considerable overestimate.

7.65 In view of the fact that:

(i) seabird by-catch rates in the regulated fishery have been reduced substantially since 1997 due to much better compliance with CCAMLR conservation measures, including those relating to closed seasons; and

(ii) it is unreasonable to assume that the unregulated fishery made comparable improvements to the timing and practice of its operations;

the Working Group decided that it should continue to use the seabird by-catch rates from 1997, as was done in this assessment last year. The assessment this year, therefore, followed the identical procedure to that used last year (SC-CAMLR-XVIII, Annex 5, paragraphs 7.60 to 7.62).

Unregulated Effort

7.66 To estimate the number of hooks deployed by the unregulated fishery, it is assumed that the fish catch rate in the regulated and unregulated fisheries is the same. Estimates of fish catch rate from the regulated fishery and estimated total catch from the unregulated fishery can then be used to obtain an estimate for the total number of hooks using the following formula:

$$\text{Effort}(U) = \text{Catch}(U)/\text{CPUE}(R),$$

where U = unregulated and R = regulated.

Catch rates for Divisions 58.4.4 and 58.5.2 were assumed to be identical to those for Division 58.5.1.

7.67 The fishing year was divided into two seasons, a summer season (S: September–April) and a winter season (W: May–August), corresponding to periods with substantially different seabird by-catch rates. There is no empirical basis on which to split the unregulated catch into summer and winter components. Three alternative splits (80:20, 70:30 and 60:40) were used.

7.68 The seabird by-catch rates used were:

Subarea 48.3 –
summer: mean 2.608 birds/thousand hooks; maximum 9.31 birds/thousand hooks;
winter: mean 0.07 birds/thousand hooks; maximum 0.51 birds/thousand hooks.

Subareas 58.6, 58.7, Divisions 58.5.1 and 58.5.2 –
summer: mean 1.049 birds/thousand hooks; maximum 1.88 birds/thousand hooks;
winter: mean 0.017 birds/thousand hooks; maximum 0.07 birds/thousand hooks.

Division 58.4.4 –
summer: mean 0.629 birds/thousand hooks; maximum 1.128 birds/thousand hooks;
winter: mean 0.010 birds/thousand hooks; maximum 0.042 birds/thousand hooks.

Results

7.69 The results of these estimations are shown in Tables 56 and 57.

7.70 For Subarea 48.3, depending on the proportionate split of catches into summer and winter, estimates of the seabird by-catch in the unregulated fishery range from a lower level (based on the mean by-catch rate of regulated vessels) of 1 800–2 400 birds in summer (and 20–30 in winter) to a potentially higher level (based on the maximum by-catch rate of regulated vessels) of 6 400–8 600 birds in summer (and 120–230 in winter).

7.71 For Subareas 58.6 and 58.7 combined, depending on the proportionate split of catches into summer and winter, estimates of the seabird by-catch in the unregulated fishery range from a lower level (based on the mean by-catch rate of regulated vessels) of 15 300–20 500 birds in summer (and 80–140 in winter) to a potentially higher level (based on the maximum by-catch rate of regulated vessels) of 27 600–37 100 birds in summer (and 340–680 in winter).

7.72 Subarea 58.7, mainly due to low levels of fishing and catch rates of fish, makes rather little contribution to this year's total.

7.73 For Divisions 58.5.1 and 58.5.2, depending on the proportionate split of catches into summer and winter, estimates of the seabird by-catch in the unregulated fishery range from a lower level (based on the mean by-catch rate of regulated vessels) of 7 600–10 200 birds in summer (and 40–80 in winter) to a potentially higher level (based on the maximum by-catch rate of regulated vessels) of 13 900–18 600 birds in summer (and 170–340 in winter).

7.74 For Division 58.4.4, depending on the proportionate split of catches into summer and winter, estimates of the seabird by-catch in the unregulated fishery range from a lower level (based on the mean by-catch rate of regulated vessels) of 1 700–3 000 birds in summer (and 10–20 in winter) to a potentially higher level (based on the maximum by-catch rate of regulated vessels) of 2 200–4 000 birds in summer (and 40–70 in winter).

7.75 The overall estimated totals for the whole Convention Area (Tables 56 and 57) indicate a potential seabird by-catch in the unregulated fishery of 26 400–35 300 (lower level) to 50 900–68 300 birds (higher level) in 1999/2000.

7.76 This compares with totals of 17 000–27 000 (lower level) to 66 000–107 000 (higher level) in 1996/97; 43 000–54 000 (lower level) to 76 000–101 000 (higher level) in 1997/98; and 21 000–29 000 (lower level) to 44 000–59 000 birds (higher level) in 1998/99. Attempts to draw inferences regarding changes in by-catch levels in the IUU fishery should be viewed with caution, given the uncertainties and assumptions involved in these calculations.

7.77 Note that the lower level value for 1998/99 in paragraph 7.76 has been corrected (from 18 000–24 000) because an incorrect seabird by-catch rate (0.049 instead of 1.049) was inadvertently used last year in the estimation of mean values for Subareas 58.6 and 58.7 and Divisions 58.5.1 and 58.5.2.

7.78 The composition of the estimated potential seabird by-catch based on data from 1997 is set out in Table 58. This indicates a potential by-catch in 1999/2000 of 7 000–15 000 albatrosses, 1 000–2 000 giant petrels and 19 000–37 000 white-chinned petrels in the unregulated fishery in the Convention Area.

7.79 As in the last three years, it was emphasised that the values in Tables 56 to 58 are very rough estimates (with potentially large errors). The present estimates should only be taken as indicative of the potential levels of seabird mortality occurring in the Convention Area due to unregulated fishing and should be treated with caution.

7.80 Nevertheless, even taking this into account, the Working Group endorsed its conclusions of recent years that such levels of mortality are entirely unsustainable for the populations of albatrosses and giant and white-chinned petrels breeding in the Convention Area.

Summary Conclusion

7.81 WG-IMALF once again urgently drew the attention of WG-FSA, the Scientific Committee and the Commission to the numbers of albatrosses and petrels being killed by unregulated vessels fishing in the Convention Area. In the last four years, an estimated total of 237 000 to 333 000 seabirds have been killed by these vessels. Of these:

(i) 21 900–68 000 were albatrosses, including individuals of four species listed as globally threatened (vulnerable) using the IUCN threat classification criteria (BirdLife International, 2000);

(ii) 5 000–11 000 were giant petrels, including one globally threatened (vulnerable) species; and

(iii) 79 000–178 000 were white-chinned petrels, a globally threatened (vulnerable) species.

7.82 These levels of loss of birds from the populations of these species and species-groups is broadly consistent with such data as exist on the population trends of these taxa, including deterioration in conservation status as measured through the IUCN criteria.

7.83 These and several other albatross and petrel species are facing potential extinction as a result of longline fishing. The Working Group again urgently requested the Commission to take action to prevent further seabird mortality by unregulated vessels in the forthcoming fishing season.

Incidental Mortality of Seabirds in relation to New and Exploratory Fisheries

New and Exploratory Longline Fisheries Proposed in 2000

7.84 As in previous years concerns were raised relating to the numerous proposals for new fisheries and the potential for these new and exploratory fisheries to lead to substantial increases in seabird incidental mortality.

7.85 In order to address these concerns, the Working Group prepared assessments for relevant subareas and divisions of the Convention Area in relation to:

(i) timing of fishing seasons;
(ii) need to restrict fishing to night time; and
(iii) magnitude of general potential risk of by-catch of albatrosses and petrels.

7.86 The Working Group again noted that the need for such assessments would be largely unnecessary if all vessels were to adhere to all elements of Conservation Measure 29/XVI. It is considered that these measures, if fully employed, and if appropriate line-weighting regimes could be devised for autoliners, should permit longline fishing activities to be carried out in any season and area with negligible seabird by-catch.

7.87 In 1999 the Working Group carried out comprehensive assessments on the potential risk of interaction between seabirds, especially albatrosses, and longline fisheries for all statistical areas in the Convention Area. These assessments were combined into a background document for use by the Scientific Committee and Commission (SC-CAMLR-XVIII/BG/23). It was agreed in 1999 that this document should be tabled and updated annually for the Scientific Committee.

7.88 This year new data on at-sea distribution of albatrosses and petrels were provided in WG-FSA-00/56. New data on at-sea distribution from satellite-tracking studies were also obtained from Terauds (2000). This information was used to update the assessment of potential risk of interaction between seabirds and longline fisheries for Subareas 88.1 and 88.2. The revised assessments for these areas are set out below (with changes/additions underlined):

(i) Subarea 88.1:

Breeding species in this area: none.

Breeding species known to visit this area: Antipodean albatross from Antipodes Island, <u>black-browed albatross, grey-headed albatross</u> and light-mantled albatross from Macquarie Island.

Breeding species inferred to visit this area: light-mantled albatross from Auckland, Campbell and Antipodes Islands; <u>sooty albatross from Indian Ocean populations</u>; grey-headed albatross and Campbell albatross from Campbell Island; wandering albatross from Macquarie Island; Chatham albatross from Chatham Islands; <u>northern giant petrel from Macquarie, Auckland and Campbell Islands</u>; <u>southern giant petrel from Macquarie Island</u>; and <u>grey petrel from Macquarie Island and New Zealand populations.</u>

Other species: short-tailed shearwater, sooty shearwater.

Assessment: the northern part of this area lies within the foraging range of eight albatross species (seven threatened) and is probably used by other albatrosses and petrels to a greater extent than the limited available data indicate. The southern part of this subarea has potentially fewer seabirds at risk.

Advice: average risk overall. Average risk in northern sector (*D. eleginoides* fishery), average to low risk in southern sector (*D. mawsoni* fishery); longline fishing season limits of uncertain advantage; the provisions of Conservation Measure 29/XVI should be strictly adhered to.

(ii) Subarea 88.2

Breeding species in this area: none.

Breeding species known to visit this area: grey-headed albatross and light-mantled albatross from Macquarie Island.

Breeding species inferred to visit this area: light-mantled albatross from Auckland, Campbell and Antipodes Islands; Antipodean albatross from Antipodes Island; grey-headed albatross and Campbell albatross from Campbell Island; wandering albatross and black-browed albatross from Macquarie Island; grey petrel and white-chinned petrel from New Zealand populations.

Other species: sooty shearwater.

Assessment: although there are few observational data from this area, the northern part of this area lies within the suspected foraging range of six albatross species (five threatened) and is probably used by other albatrosses and petrels to a greater extent than the limited available data indicate. The southern part of this subarea has potentially fewer seabirds at risk.

Advice: low risk. No obvious need for restriction of longline fishing season; apply Conservation Measure 29/XVI as a seabird by-catch precautionary measure.

7.89 Because the revisions to the assessments are not extensive, the Working Group did not feel there was a need to produce a revised version of SC-CAMLR-XVIII/BG/23 this year. However, it drew to the attention of the Scientific Committee and Commission that in Figure 1 of SC-CAMLR-XVIII-BG/23 the codes for potential risk of interaction with seabirds for Subareas 48.1 and 48.4 should be 1 and 3 respectively (not 2 as depicted).

New and Exploratory Longline Fisheries Operational in 1999/2000

7.90 Of the 22 proposals last year for new and exploratory longline fisheries, only four were actually undertaken: by Uruguay in Division 58.4.4, by France and by South Africa in Subarea 58.6 and by New Zealand in Subarea 88.1.

7.91 No seabird by-catch was reported to have been observed in any of these fisheries. Those in Division 58.4.4 and Subarea 58.6 were undertaken in winter. That in Subarea 88.1 followed the specific requirements set out in Conservation Measure 190/XVIII, the results being described in detail in CCAMLR-XIX/17 and WG-FSA-00/37.

New and Exploratory Longline Fisheries for 2000/01

7.92 The areas for which proposals for new and exploratory longline fisheries were received by CCAMLR in 2000 were:

Subarea 48.1	Argentina
Subarea 48.2	Argentina
Subarea 48.6	Argentina, Brazil, South Africa
Division 58.4.1	Argentina
Division 58.4.2	Argentina
Division 58.4.3	Argentina, France
Division 58.4.4	Argentina, Brazil, France, South Africa, Ukraine, Uruguay
Division 58.5.1	Argentina, Brazil, France
Division 58.5.2	Brazil, France
Subarea 58.6	Argentina, France, South Africa
Subarea 58.7	France
Subarea 88.1	Argentina, New Zealand, South Africa, Uruguay
Subarea 88.2	Argentina, South Africa, Uruguay
Subarea 88.3	Argentina, Uruguay.

7.93 All the areas listed above were assessed in relation to the risk of seabird incidental mortality according to the approach and criteria set out in paragraph 7.85, SC-CAMLR-XVIII/BG/23 and paragraph 7.88. A summary of risk level, risk assessment, WG-IMALF recommendations relating to fishing season and any inconsistencies between these and the proposals for new and exploratory longline fisheries in 2000, is set out in Table 59.

New Zealand Proposal in respect of Subarea 88.1

7.94 The Working Group noted New Zealand's request for a continuation of the variation to Conservation Measure 29/XVI for Subarea 88.1, as provided for previously by Conservation Measures 169/XVII and 190/XVIII. The variation is to allow line-weighting experiments to continue south of 65°S in Subarea 88.1 (CCAMLR-XVIII/10 and CCAMLR-XIX/17). Conservation Measures 169/XVII and 190/XVIII allowed New Zealand vessels to set lines during the daytime south of 65°S in Subarea 88.1 if vessels weighted their lines and achieved a minimum sink rate of 0.3 m/s for all parts of the longline. The variation was sought because during austral summer (December to March) there are insufficient periods of darkness at these latitudes for exploratory fishing to occur.

7.95 In 1998 the Working Group noted that line weighting has the best potential as an alternative mitigation measure, and noted the need to urgently gain information on longline sink rates. Accordingly, the Working Group supported the New Zealand proposal. In 1999 the Working Group noted that the experiment had been conducted successfully in the 1998/99 season, no seabird mortality had occurred and that valuable data had been collected on autoline sink rates. However, the Working Group noted that operational issues needed to be further investigated and more data collected. The Working Group again supported the proposal to allow a variation to Conservation Measure 29/XVI for this experiment.

7.96 The Working Group assessed the current proposal (CCAMLR-XIX/17) on the basis of data provided in WG-FSA-00/58. The model presented is now well developed, but requires further data on variation in weight-spacing regimes to be useful for monitoring line sink rates without mechanical verification.

7.97 The Working Group noted that, with this further experimentation, it should be possible to specify line-weighting regimes for autoline vessels which, in conjunction with all other mitigating measures, should enable these vessels to fish during daylight with zero, or insignificant, by-catch of seabirds, at least in areas of average (or lower) risk (see also paragraph 7.148).

7.98 The Working Group, therefore, strongly supported the New Zealand proposal for a variation to Conservation Measure 29/XVI for those New Zealand flagged vessels prepared to undergo line sink-rate certification and comply with all experimental protocols.

7.99 The Working Group noted that the proposals for longline fishing in Subarea 88.1 by Argentina, South Africa and Uruguay did not contain any proposal for line-weighting (or other) experiments in support of any potential exemption from the night-setting provision contained in paragraph 3 of Conservation Measure 29/XVI.

7.100 The Working Group recommended that any other vessels allowed to conduct longline fishing in Subarea 88.1 should meet the same requirements as set out in paragraph 7.98.

7.101 The Working Group also noted the proposal by New Zealand to place a limit on any potential seabird by-catch during the daylight setting variation to Conservation Measure 29/XVI on a per-vessel basis. Any vessel catching three seabirds would have to revert immediately to Conservation Measure 29/XVI.

7.102 The Working Group endorsed this proposal, noting that placing a limit on a per-vessel basis was a commendable way of encouraging greater responsibility at the level of individual vessels. Further, the Working Group agreed with the limit of three seabirds per vessel proposed by New Zealand, whilst noting this number was not a scientific estimation of an appropriate level of seabird by-catch, but a precautionary small number.

7.103 The Working Group recommended that any other vessels allowed to conduct longline fishing in Subarea 88.1 should be subject to the same seabird by-catch limit, and consequential requirements, as set out in paragraph 7.101.

Incidental Mortality of Seabirds during Longline
Fishing outside the Convention Area

7.104 WG-FSA-00/13 evaluated interactions between seabirds and longline fisheries operating around Tristan da Cunha and Gough Islands. The demersal fisheries for bluefish and alfoncino, despite setting in daytime and attracting many birds (including albatrosses), had an observed by-catch rate of 0.001 birds/thousand hooks. In contrast, limited observations on board a Japanese autoliner longline fishing in winter for tuna, suggested that by-catch rates may exceed 1 bird/thousand hooks. Black-browed albatross (probably from the South Georgia population) was the only species observed caught. However at other times of year, the globally endangered Tristan albatross (*Diomedea dabbenena*) and the globally critically endangered spectacled petrel (*Procellaria conspicillata*) would be potentially at high risk.

7.105 The Working Group endorsed the recommendations in WG-FSA-00/13 that tuna longliners operating in these waters should be required to apply mitigating measures, preferably identical to those required for high-risk areas within the Convention Area.

7.106 It was disturbing to note the lack of any measures to reduce seabird by-catch on Japanese longliners, as the Working Group understood, from previous reports by Japan to ICCAT and CCSBT, that these vessels were required to use at least streamer lines wherever and whenever fishing.

7.107 Mr Smith reported that New Zealand continued to undertake observations of both pelagic and demersal longline fisheries. Records of actual by-catch numbers observed and, where possible, estimates of total seabird by-catch continue to be made annually and are available in Baird (2000).

7.108 Mr Baker reported that no Australian longline observer program had been in operation last year. Previous years' experiences had been reported in detail in SC-CAMLR-XVIII, Annex 5, paragraphs 7.96 to 7.100.

7.109 The Working Group regretted the absence of other data from Members on incidental mortality of seabirds, especially for regions adjacent to the Convention Area, such as southern South America and the Falkland/Malvinas Islands.

7.110 Prof. Croxall indicated that some relevant data, particularly from Argentina and Brazil, had been presented at the Albatross Conference in Hawaii, USA (paragraph 7.20), and at a recent Marine Science Congress in Argentina. He would try to arrange the circulation of such information intersessionally.

7.111 The Working Group regretted that so little information had been forthcoming from areas adjacent to the Convention Area on topics of considerable significance, viz:

(i) longline fishing effort;
(ii) incidental mortality of seabirds breeding within the Convention Area; and
(iii) implementation of the provisions of Conservation Measure 29/XVI in adjacent fisheries.

7.112 The Working Group reiterated the request to Members to provide such data to the next meeting of WG-IMALF.

Research into and Experience with Mitigating Measures

Offal Discharge

7.113 In Subarea 48.3 four vessels were discharging offal on the same side as the haul, in contravention of Conservation Measure 29/XVI (paragraph 7.56). Three of these vessels (*Isla Sofia*, *Isla Camila* and *Jacqueline*) have persisted with the practice for the last three years.

7.114 Offal discharge should be on the opposite side of the haul irrespective of whether or not offal is stored during line hauling. On long cruises, vessels may not have the freezer capacity to freeze and store offal for discharge at the end of the cruise (200 tonnes of toothfish might accrue 80 tonnes of offal). The retention of offal on a daily basis might also present problems, particularly during periods of high fish catch rates and production of offal. Unless under strict observation, the incentive will be great to jettison offal as it is accrued during the fishing operation. This problem can be rectified if vessels re-engineer offal dumping facilities to discharge offal on the opposite side to the line-hauling site of vessels. Re-engineering offal discharge facilities will also result in vessels discharging offal in a seabird-safe manner when vessels leave the Convention Area for other fishing grounds.

7.115 Offal discharge sites should be re-engineered according to the engineering diagrams of the *Koryo Maru 11* (SC-CAMLR-XVIII, Annex 5, paragraph 7.110).

7.116 In Subarea 88.1 the three New Zealand vessels achieved full compliance with the conservation measure by processing offal into fish meal on board, or returning all offal to port for onshore processing into fish meal. This includes all baits returned on board and removed from hooks. Other vessels should be encouraged to adopt the same solution to the problem.

Underwater Funnel

7.117 WG-FSA-00/29 reported that in Subareas 58.6 and 58.7, the *Eldfisk* used a Mustad underwater funnel (setting the line 1–2 m underwater). It set 5.12 million hooks over a two-year period, the results of the first year being reported in WG-FSA-00/42 Rev. 1 (SC-CAMLR-XVIII, Annex 5, paragraph 7.122). Bait loss and fish catch rates were not affected by the use of the funnel. At night in summer, by-catch rates were 0.013 birds/thousand hooks when the funnel was not in use and 0.009 birds/thousand hooks when the funnel was in use. Comparable rates for summer daytime sets were 0.05 and 0.02 birds/thousand hooks for control and underwater setting respectively. Birds caught were white-chinned petrels (88% of the 114 birds killed).

7.118 The Working Group noted that this three-fold reduction in seabird by-catch rates when the funnel was in use is encouraging. However, the Mustad funnel is short, deploys bait above the propeller turbulence (forces baited hooks to the surface) and setting depth is affected by both swell height and the load status of the vessel (sits lower in the water if fully fuelled and has full freezers). To avoid these problems, underwater setting tubes should deploy baits beneath the propeller turbulence so that the turbulence forces the baits down.

7.119 WG-FSA-00/64 reported the results of preliminary trials (12 260 hooks) of an underwater setting tube in the Australian domestic tuna fishery. The tube set the line 6 m under water. A total of eight birds was caught during the development trials but none were

caught once design and operational deficiencies were corrected. The results to date look promising. Potentially, for tuna fishing at least, setting lines deep under water (beneath propeller turbulence) could be the most effective measure to date to reduce seabird mortality.

7.120 WG-FSA-00/61 reported on several years of experimentation to reduce seabird by-catch (principally northern fulmars) in Norwegian longline fisheries. The results of trials with bird-scaring lines, an underwater setting tube and a line shooter were reported. Catches were 0–0.40 birds/thousand hooks when mitigation measures were tested and 0.55–1.75 birds/thousand hooks when no measures were employed. The setting funnel reduced by-catch by 72% (126 900 hooks in total) and the line shooter reduced by-catch by 59% (58 420 hooks in total).

7.121 It should be noted, however, that in the Norwegian fishery the dominant seabird species, the northern fulmar (*Fulmarus glacialis*), although very abundant, is not a proficient diver and is unable to ingest baited hooks whole. Most captures occur by birds getting hooked in the wing or body; the North Sea does not have albatross species or proficient divers like white-chinned petrels and grey petrels, whose interaction with fishing vessels is more difficult to mitigate. Nonetheless, the results of WG-FSA-00/61 are encouraging and if adopted in Norwegian longline fisheries, reduction of seabird by-catch would be expected to reach levels where potential threats to populations are eliminated.

Streamer Lines

7.122 In Norwegian trials (186 132 hooks in total) (WG-FSA-00/61), the most effective measure was the streamer line which reduced seabird by-catch by 98–100%. Significantly, the use of the bird-scaring line gave a 32% increase in fish catch compared to control sets, because fewer baits were lost to seabirds.

7.123 Because streamer lines may lose their effectiveness when line setting in crosswinds, the use of paired streamers lines, which should increase longline protection in this type of weather condition, should be investigated, particularly for vessels which fish in summer in Subareas 58.6 and 58.7. The USA recommends the use of paired streamer lines in the Gulf of Alaska halibut fishery.

7.124 To address this problem, New Zealand vessels in Subarea 88.1 use a boom and bridle system to allow the streamer line to be deployed directly over the longline being set, irrespective of the wind direction.

7.125 More attention is still needed to the correct design and deployment of streamer lines. As a minimum requirement, vessels must use streamer lines to CCAMLR specifications in regard to length, attachment height on vessels, number of streamers, length of streamers and distance between streamers. All these characteristics of streamer lines will have an important influence on the effectiveness of streamer lines in reducing seabird by-catch. Better provision should be made for observers to report on these characteristics of streamer lines.

Line Shooter

7.126 Norwegian trials (WG-FSA-00/61) also examined the effect of a line shooter on seabird by-catch rates. The line shooter reduced seabird by-catch by 59% (58 420 hooks), less than for streamer lines and the underwater funnel. Nevertheless, this device may have considerable utility as an auxiliary mitigating measure for autoline vessels.

Artificial Bait

7.127 WG-FSA-00/50 reported that no experiments testing the performance of natural and artificial baits regards attraction to seabirds have been conducted.

Line Weighting

7.128 WG-FSA-00/58 reported on the effect on longline sink rate of a range of environmental and operational issues of autoline vessels fishing in Subarea 88.1. Of the effects tested, added weight explained 72% of the variance in the sink rate of longlines to 15 m depth. Swell height and setting speed explained an additional 4% and 2% respectively. The results to date are preliminary, but when the work is completed the ensuing model will, potentially, eliminate the need to use time-depth recorders to estimate longline sink rates on autoline vessels.

Toothfish Pots

7.129 WG-FSA-00/23 reported on the use of pots to catch toothfish, as a method to avoid seabird by-catch, in Subarea 48.3. A total of 11 088 pots was deployed between 16 March and 11 May 2000. No seabirds were caught during the trial, although plenty of seabirds were available to interact with vessels. This suggests that the use of pots will eliminate seabird by-catch. However, present catch rates of toothfish were not commercially viable and there was a significant catch of crabs. Technological refinements are necessary before the feasibility of this fishing practice can be verified and further trials are planned.

Other Measures

7.130 Mr Smith reported that initial trials had been undertaken with a laser gun and aircraft spotlights within the New Zealand EEZ. The results were such that full trials were considered inappropriate as the measures appeared totally ineffective.

General

7.131 The Working Group considered a New Zealand report on the technical feasibility of video monitoring of seabird interactions on fishing vessels (WG-FSA-00/62). The study

concluded that the technology is now available to go forward with this method, that the costs are still moderately high and that without suitable software the issue of viewing all footage onshore remains. However, the study suggests that the method is technically feasible and that a pilot trial should go ahead.

7.132 The Working Group cautioned that when considering the substitution of observers with video surveillance of fishing operations, there is enhanced potential for fishers to disguise by-catch events. For example, the practice in some fisheries of line-cutting prior to landing of a by-catch species (WG-FSA-98/31) could mean that the identity of by-catch could go unrecorded by video.

7.133 Nevertheless, the Working Group concluded that video monitoring of seabird interactions on fishing vessels could be very useful and possibly one way of increasing the proportion of hooks observed for seabird by-catch.

Policy Considerations in relation to Mitigating Measures and Conservation Measure 29/XVI

7.134 Conservation Measure 29/XVI is the key element in minimisation of incidental mortality of seabirds during longlining in the Convention Area.

7.135 Last year WG-FSA and the Scientific Committee advised the Commission (SC-CAMLR-XVIII, Annex 5, paragraph 7.150) that:

(i) sustained development of underwater setting offers the most likely medium- to long-term solution to the problem;

(ii) work to develop line-weighting regimes to ensure sink rates that will preclude seabirds accessing bait offers the best short-term solution, as well as the likelihood of permitting exemption from several other mitigating measures currently in use in the Convention Area; and

(iii) in the meantime, improved compliance with the existing suite of mitigation measures in Conservation Measure 29/XVI is essential.

7.136 Although there is still some continuing improvement in compliance with Conservation Measure 29/XVI – and simple means exist to improve this further – three important problems remain:

(i) how to get fishers to comply with the straightforward elements of the conservation measure, in respect of offal discharge, streamer lines and night setting;

(ii) how to tackle the consistent inability of vessels to comply with the element of the conservation measure that specifies the line-weighting regime for Spanish system longliners; and

(iii) how to develop the requirements for an appropriate line-weighting regime for autoliners.

7.137 Some suggestions on the way forward on these topics, including the potential for revision of elements of Conservation Measure 29/XVI, are set out below.

Offal Discharge

7.138 The Working Group noted the reluctance of some vessels fishing in the Convention Area to implement easy-to-achieve conservation measures such as discharging offal on the opposite side of the haul. Three vessels (*Isla Sofia*, *Isla Camila* and *Jacqueline*) continued to discharge offal on the same side as the haul, in direct contravention of Conservation Measure 29/XVI. Attention was drawn to this situation involving these three vessels last year (SC-CAMLR-XVIII, Annex 5, paragraph 7.110). This year the *Faro de Hercules* also discharged offal in a manner in contravention of the conservation measure. Reconfiguring vessels to comply with this measure is clearly feasible, as demonstrated by the compliance achieved by most vessels currently fishing in the Convention Area (i.e. in Subarea 48.3 no compliance in 1997; 76% compliance in 2000). The fact that the vessels mentioned above continue to be licensed each year is contrary to the expressed views of the Commission on this topic (CCAMLR-XVII, paragraph 6.42(i)). The Working Group reiterated that vessels which have proven unable or unwilling to comply with this provision of Conservation Measure 29/XVI should not be allowed to fish in the Convention Area.

Streamer Lines

7.139 Paragraph 7.125 indicates the importance of adhering strictly to the provisions of Conservation Measure 29/XVI in this regard, as a minimum requirement. Paragraphs 7.123 (use of paired streamer lines) and 7.124 (device to centre a streamer line over the longline) indicate potential improvements to the nature and operation of streamer lines which could be reflected in some future revision of the conservation measure. Members are urged to test these potential improvements and report to the Working Group on their efficacy.

Night Setting

7.140 The Working Group reiterated the importance of avoiding setting during daylight, and in particular during dusk and dawn, as many species, particularly white-chinned petrels, are very active at these times.

7.141 It is possible that part of the failure to comply with this measure reflects uncertainty over the definition of the light levels that constitute the beginning and end of night. It was suggested that some simple device (e.g. light meter, Secchi disk) might be provided to give fishing masters and observers unambiguous empirical guidance as to when line setting should commence. Members were encouraged to investigate this further.

7.142 Even without such assistance, compliance with this element of the conservation measure – which is of particular importance – is very straightforward. Vessels which are unable or unwilling to comply should not be allowed to fish in the Convention Area.

Line Weighting – Spanish System

7.143 The current prescription for Spanish system longlining of a minimum of a 6 kg weight spaced every 20 m has proven consistently unattainable by any vessel since its introduction. Dr Robertson reported that correspondence with fishing masters indicated that 20 m weight spacing was insufficient to bridge undulations in bottom topography, causes line tangles during setting and hauling, and requires slower setting speeds and heavier mother lines.

7.144 Although none of these problems are incapable of solution, albeit at extra cost and effort to the fisher, the Working Group felt that there was a strong case for an interim relaxation of the current requirements of this element of Conservation Measure 29/XVI.

7.145 The Working Group recollected the line-weighting experiment carried out last year (SC-CAMLR-XVIII, Annex 5, paragraphs 7.111 to 7.115) which showed that increasing line weighting from 4.25 kg at 40 m to 8.5 kg at 40 m reduced bird mortality from 3.98 birds/thousand hooks to <1.0 birds/thousand hooks when setting during daylight in the breeding season of susceptible albatross and petrel species in Subarea 48.3.

7.146 In circumstances where all other elements of Conservation Measure 29/XVI apply (e.g. in respect of night setting, streamer lines and offal discharge) and with appropriate closed seasons, the Working Group recommended that the line-weighting regime for the Spanish system of longlining should be set at weights of a minimum of 8.5 kg spaced at no more than 40 m intervals.

7.147 Members, technical coordinators and observers were encouraged to report in detail on the use of, and compliance with, this requirement. Further experiments on line weighting were encouraged to try to develop a regime that might be appropriate for use at times of year other than winter and for times of day other than night time.

Line Weighting – Autoline System

7.148 Currently, Conservation Measure 29/XVI does not include a line-weighting requirement for autoline vessels. The Working Group noted New Zealand's proposed experimental work in Subarea 88.1 to complete a predictive model for autoline sink rates taking into account line weight and environmental variables. The Working Group strongly supported this initiative. It encouraged Members to conduct similar trials in areas where the interaction between albatrosses and diving species of petrels and longlines will be more difficult to mitigate. At the completion of such trials the Working Group should be in a good position to recommend a line weighting for autoline vessels that will have utility for all subareas of the Convention Area.

General Observations

7.149 The Working Group recommended that seabird by-catch in the Convention Area should be managed by measures adopted in Subarea 48.3, where in the 1999/2000 season with

over 14 million hooks set only 21 seabirds were estimated to have been caught. In Subarea 48.3 the combination of a closed season in summer, night setting, the use of streamer lines and proper offal discharge practices has effectively solved the seabird by-catch problem.

7.150 The Working Group recognised that the ultimate aim in managing seabird by-catch in the Convention Area will be to allow fishing at any time of day without seasonal closure of fishing grounds. However, current indications are that allowing fishing in summer, at night, using streamer lines, proper offal discharge practices and c. 40 m between weights on longlines (current practice for Spanish system vessels) will still result in unacceptably high mortality of seabirds. Clearly, more time is required to allow experimentation into the effectiveness of line-weighting concepts and underwater setting devices with the Spanish system that will reduce seabird by-catch and be more acceptable to the fishing industry. In the meantime, the Working Group believed that seabird by-catch in the Convention Area should be managed in accordance with practices adopted in Subarea 48.3.

Vessel Accreditation

7.151 In spite of the successes in Subarea 48.3, best practice regarding the use of streamer lines, night setting and offal discharge procedures has not been achieved and should be, especially since these mitigating measures are simple and easy to use.

7.152 The Working Group therefore recommended that vessels should not be allowed to fish in the Convention Area unless they comply completely with all the elements of Conservation Measure 29/XVI relating to streamer lines, night setting and offal discharge.

7.153 The Working Group recommended that these requirements should be brought to the attention of technical coordinators (and through these to fishing companies and fishers) at the earliest opportunity after the conclusion of the Commission meeting this year. It should be made absolutely clear that vessels unable to comply with the elements of Conservation Measure 29/XVI relating to night setting, offal discharge and streamer lines should not expect to be allowed or licensed to fish in the Convention Area in 2000/01.

International and National Initiatives relating to Incidental Mortality of Seabirds in relation to Longline Fishing

Workshop on Albatross and Petrel Mortality from Longline Fishing

7.154 This workshop, held in Hawaii, USA, in May 2000 and attended by approximately 75 biologists, resource managers and conservationists from many countries (including eight members of WG-IMALF), reviewed the effects of longlining on albatrosses and petrels on a global scale (SC-CAMLR-XIX/BG/12). The workshop made recommendations, relating to albatross research and conservation, in respect of:

(i) the use of appropriate multilateral, intergovernmental instruments, mechanisms and fora;

(ii) improved practical means to reduce seabird by-catch and promote their wide and effective use; and

(iii) enhanced monitoring of seabird by-catch and population trends, complemented by relevant research into population structure, dynamics and foraging ecology.

7.155 The workshop indicated that priorities for sustaining existing research and monitoring work, and developing new studies were:

(i) monitoring of status and trends of albatross populations, complemented by demographic research;

(ii) undertaking genetic studies to understand structure and stock identity within albatross species and populations;

(iii) collecting comprehensive data on by-catch rates and fishing effort; and

(iv) defining foraging ranges by age, sex and season, using new technologies, devices and analytical approaches.

7.156 In order to facilitate cooperation and information exchange throughout the international seabird research and conservation communities, the workshop recommended that the issue of seabird mortality in longline fisheries should be addressed by means of further national and international workshops and conferences. BirdLife International was invited, in the context of its 'Save the Albatross Campaign', to sponsor a workshop in 2001 among Latin-American states to address the issue of seabird by-catch in longline fisheries in that region.

7.157 The Working Group was informed that this workshop is to be held in Montevideo, Uruguay, and will be co-convened by Uruguayan and Brazilian scientists. Dates will be advised to CCAMLR as soon as they are available.

7.158 In respect of training scientific observers for longline fisheries, the Hawaiian workshop attempted to facilitate collaboration between New Zealand and South American countries. New Zealand funding for such initiative is understood to be available and it is hoped that a way to utilise this will be arranged at the Montevideo workshop.

FAO International Plan of Action for Reducing Incidental Catch of Seabirds in Longline Fisheries (IPOA–Seabirds)

7.159 Last year Members were invited to report on progress in developing NPOA–Seabirds under the FAO–IPOA initiative (SC-CAMLR-XVIII, paragraph 4.75(i) and Annex 5, paragraph 7.131).

7.160 Mr Smith reported that New Zealand has completed its review of seabird interactions with longline fisheries as required by FAO. The review has resulted in the development of a draft NPOA–Seabirds. The draft has been circulated within New Zealand for consultation, and implementation is planned for early 2001. Copies are available from New Zealand and requests can be forwarded to <smithn@fish.govt.nz>.

7.161 Mr Baker reported that Australia's responsibilities in meeting the requirements of an NPOA are largely met by the implementation of the Threat Abatement Plan (TAP) for the incidental catch (or by-catch) of seabirds during oceanic longline fishing operations. This plan was prepared by the Australian Government following the listing in 1995 of longline fishing as a key threatening process under the *Endangered Species Protection Act 1992*.

7.162 The objective of the TAP is to reduce seabird by-catch in all fishing areas, seasons and fisheries to below 0.05 birds/thousand hooks, based on 1998 fishing levels. This represents a reduction of up to 90% of seabird by-catch within the Australian Fishing Zone (AFZ), and should be achievable within the five-year life of the plan. The TAP prescribes the actions necessary to achieve this objective.

7.163 Australia is still intending to prepare an NPOA. The main contribution of the NPOA will be to outline an approach by which the issue of seabird by-catch can be promoted through regional fisheries fora, including the facilitation of information exchange and mitigation technologies. It is expected that a draft document will be prepared by the end of the year.

7.164 For Brazil, Dr Fanta indicated that, as part of the initiatives being generated by new national committees responsible for fisheries and environmental matters, scientists with experience of longline fisheries and seabird interactions had been invited to collaborate in the preparation of a draft NPOA.

7.165 Prof. C. Moreno (Chile) indicated that he was responsible for coordinating the preparation of a draft NPOA for Chile.

7.166 Prof. Croxall reported that the European Community had recently decided to embark on an assessment of Community longline fisheries. A questionnaire had been circulated to members requesting information on the nature and extent of longline fishing (and associated incidental catches of seabirds) in the waters of European Community Member States and on the high seas, and what, if any, actions are being taken to address by-catch issues. It was hoped that the European Community would agree to produce a Community-based plan to ensure harmonisation among fleets operating in different European Community EEZs and regional seas. Some issues relating to operations regarding overseas territories may still need to be clarified.

7.167 Dr Holt reported that the USA draft NPOA would be completed by the end of 2000. Further details can be obtained from www.nmfs.noaa.gov or from <kim.rivera@noaa.gov>.

7.168 Norway was understood to be developing an NPOA but no details were available to the meeting.

7.169 No information on progress towards NPOAs was available for other CCAMLR Members. All Members were requested to provide WG-IMALF with information on the progress of their NPOAs, making copies as widely available as appropriate.

Convention on the Conservation of Migratory Species

7.170 The 6th Conference of Parties (COP) to the Convention on the Conservation of Migratory Species of Wild Animals (CMS or Bonn Convention), was held in South Africa in

November 1997. Dr J. Cooper (South Africa) attended as an observer of the CCAMLR Scientific Committee. SC-CAMLR-XIX/BG/7 reports on discussions and outcomes of this conference which may be of interest to CCAMLR.

7.171 A proposal by South Africa to add five species of *Procellaria* and two species of *Macronectes* petrels to Appendix II of the CMS was accepted. This listing opens the way for the development of a Range-State Agreement to further their protection. At earlier meetings of the CMS Scientific Council the need for a Southern Hemisphere Albatross Agreement had been recognised. As albatrosses, *Procellaria* petrels and *Macronectes* petrels are all subject to incidental mortality arising from longline fishing, the moves by CMS to further the conservation and protection of these birds were welcomed by the Working Group.

Regional Agreement for the Conservation of Albatrosses

7.172 The WG-IMALF meeting in 1999 was informed of the efforts by the Group of Temperate Southern Hemisphere Countries (known as the Valdivia Group) to develop an agreement for the conservation of albatrosses in cooperation with other southern hemisphere albatross Range States. Members of the Valdivia Group are Argentina, Australia, Brazil, Chile, New Zealand, South Africa and Uruguay. The Working Group was advised of further actions to progress this initiative which have taken place over the last 12 months (CCAMLR-XIX/BG/10 and BG/15).

7.173 Following Resolution 6.3 at the 6th COP to the CMS in South Africa, Australia held a number of informal consultations with relevant Range States to discuss the development of an international Agreement on albatross conservation.

7.174 The positive outcomes of these consultations resulted in Australia hosting the first international meeting to which all southern hemisphere albatross and petrel Range States were invited. This meeting was held in Hobart, Australia, from 10 to 14 July 2000, and aimed to facilitate the development of an Agreement on the Conservation of Albatrosses and Petrels of the Southern Hemisphere. The meeting was a significant step towards effective global cooperation in albatross and petrel conservation. A total of 28 parties was invited to attend the meeting, including Range States and international organisations. Twelve Range States of southern hemisphere albatrosses and petrels and five international organisations attended the meeting. CCAMLR was represented by its Science Officer.

7.175 The meeting unanimously supported the fundamental principle of developing an international agreement focused on the conservation of albatrosses and petrels. The purpose of the agreement is to establish a cooperative and comprehensive framework and process to restore southern hemisphere albatrosses and petrels to a favourable conservation status. The agreement aims to stop or reverse population declines by coordinating action to mitigate known threats to albatross and petrel populations.

7.176 The general structure and format for an Action Plan (Annex 2 of the Agreement) was developed. The details of this Action Plan were subject to further consideration by participating parties, who were requested to provide comments to the Chair of the CMS Scientific Council by the end of September 2000. The Convener of WG-IMALF coordinated responses on the Action Plan from Working Group members.

7.177 All participants at the Hobart meeting (paragraph 7.174) agreed that a formal negotiation towards a legally binding agreement to promote albatross conservation should be the next step, and that this should occur as soon as practicable. South Africa has offered to host the next meeting, provisionally early next year. It is hoped that a technical meeting to further develop the content of the draft Action Plan could be held immediately prior to the proposed negotiation session.

7.178 The Working Group welcomed the progress made towards an agreement which had very substantial implications for the conservation of seabirds in marine and terrestrial ecosystems. It recommended that all Members of CCAMLR should participate actively in these meetings, especially by facilitating the attendance of appropriate technical and scientific experts.

International Fishers' Forum

7.179 The Working Group noted that New Zealand's International Fishers' Forum (IFF) on Solving the Incidental Capture of Seabirds in Longline Fisheries is to be held the week after the CCAMLR Commission meeting.

7.180 The forum will be an opportunity for fishers, gear technologists and researchers to meet and discuss mitigation measures used in longline fisheries around the world, and to learn about new measures currently under development. A second objective for the forum will be to address the use of modelling tools to predict the impact of fisheries on seabird species. Seabird modelling experts will report on projects undertaken to date and will consider questions posed by workshop participants.

7.181 The Working Group encouraged Member countries longlining in the Convention Area to facilitate the participation of other scientists, fishery managers and fishers in the IFF. It noted that several members of the Working Group would participate in the IFF.

Commission for the Conservation of Southern Bluefin Tuna (CCSBT)

7.182 No information was available this year to the Working Group from this Commission or from its Ecologically Related Species Working Group (ERSWG). It was understood that the ERSWG had not met in 2000.

Indian Ocean Tuna Commission (IOTC)

7.183 No information was available this year to the Working Group from this Commission.

General

7.184 Prof. Moreno summarised recent initiatives in Chile, under the auspices of WG-IMALF, which had arisen from the tri-nation collaborative project (involving Australia, Chile and the UK) of research on albatrosses at Islas Diego Ramirez.

7.185 Prof. Moreno, Drs J. Valencia (INACH) and Robertson held discussions with Mr D. Albarran Ruiz-Clavijo, Undersecretary of Fisheries and Chair of the Chilean CCAMLR Committee, to discuss potential Chilean activities to address incidental mortality of seabirds in longline fisheries.

7.186 The meeting had recollected the importance of Chilean waters and activities by Chilean fisheries with respect to albatrosses breeding at Chilean sites and to those visiting from elsewhere, particularly New Zealand.

7.187 It was agreed that:

(i) relevant data could be collected from Chilean artisanal longline fisheries and from the longline fisheries for hake in the southern channels (which are believed to have very low seabird by-catch rates due to using droplines);

(ii) future discussions and actions relating to incidental mortality should involve collaboration with the major commercial fishery interests;

(iii) a meeting would be held, before the end of 2000, with companies involved in southern demersal longline fisheries, to discuss how to reduce incidental mortality; and

(iv) legislation would be prepared to provide an appropriate basis, along the lines of the CCAMLR scheme, for the operation of scientific observers on board Chilean longline vessels operating in national waters.

7.188 The Working Group congratulated Prof. Moreno and Dr Robertson for facilitating these important developments and offered whatever assistance would be appropriate to develop these and other initiatives (e.g. FAO–NPOA).

7.189 The Working Group noted with appreciation the efforts of the World Bird Federation of Taiwan (in association with BirdLife International) to provide information for fishers on the avoidance of incidental mortality in longline fisheries. Copies of the two leaflets, widely circulated within Taiwanese fishing industries, are provided in SC-CAMLR-XIX/BG/21.

Advice to the Scientific Committee

Research into the Status of Seabirds at Risk

7.190 The review of availability of data on:

(i) size and trends of populations of albatross species and of *Macronectes* and *Procellaria* petrel species vulnerable to interactions with longline fisheries (paragraph 7.9(i));

(ii) the foraging ranges of populations of these species adequate to assess overlap with areas used by longline fisheries (paragraph 7.9(ii)); and

(iii) genetic research relevant to determining the provenance of birds killed in longline fisheries (paragraph 7.12);

revealed that considerable further detail is necessary for which Members will be requested during the coming year (paragraphs 7.10, 7.11 and 7.14).

Incidental Mortality of Seabirds during Regulated
Longline Fishing in the Convention Area in 2000

7.191 (i) Timely data submission ensured comprehensive analysis of this year's data (Tables 48 to 51).

(ii) Accuracy of seabird by-catch estimation is still affected by the low proportion of hooks being observed on some cruises, particularly in Subarea 48.3 (paragraphs 7.25 to 7.29); intersessional work to address this issue is required (paragraph 7.30).

(iii) For Subarea 48.3 the total estimated seabird by-catch was only 21 birds at a rate of 0.0004 birds/thousand hooks (paragraphs 7.32 and 7.33) (compared with 210 at a rate of 0.01 birds/thousand hooks last year); fishing season restrictions and improved compliance with Conservation Measure 29/XVI have reduced by-catch in the regulated fishery in this subarea to negligible levels (paragraph 7.49).

(iv) For Subareas 58.6 and 58.7 the total estimated seabird by-catch was 516 birds (a three-fold increase over last year) at a rate of 0.02 birds/thousand hooks (compared with 0.03 birds/thousand hooks last year) (paragraphs 7.34 and 7.35). Increased by-catch this year was mainly due to greater fishing effort, but poorer compliance with Conservation Measure 29/XVI also contributed (paragraph 7.50).

(v) Differences in by-catch rates between Subarea 48.3 and Subareas 58.6 and 58.7 were clearly attributable to:

(a) vessels in the latter subareas fishing in close proximity to major breeding sites of albatrosses and petrels during their breeding season; and

(b) poor compliance with night-time setting requirements (paragraph 7.43).

The Working Group reiterated its recommendation of last year that fishing within 200 n miles of the Prince Edward Islands should be prohibited from January to March inclusive (paragraph 7.44).

(vi) Once again, the data for the French EEZs in Subarea 58.6 and Division 58.5.1 were not available for analysis; their submission was requested (paragraphs 7.45 and 7.46).

(vii) For Subarea 88.1 there had been no seabird by-catch for the third successive year due to strict compliance with Conservation Measure 29/XVI (including the exemption from night setting) and Conservation Measure 190/XVIII (paragraph 7.47). No seabird by-catch was reported for fishing in Division 58.4.4 (paragraph 7.31).

Compliance with Conservation Measure 29/XVI

7.192 (i) Overall compliance with this conservation measure this year, compared to last year, was slightly improved in Subarea 48.3, slightly poorer in Subareas 58.6 and 58.7, poor in Division 58.4.4 and complete in Subarea 88.1.

(ii) Streamer lines – compliance with the streamer-line design was poor; only 33% of the streamer lines deployed complied fully, mainly because their length was less than 150 m. Vessels which have not complied with this element of the conservation measure over at least the last two years include *Argos Helena*, *Eldfisk*, *Illa de Rua*, *Isla Gorriti, Lyn, Jacqueline, Magallanes III, No. 1 Moresko* and *Tierra del Fuego* (Table 55 and paragraph 7.52).

(iii) Offal discharge – in Subareas 58.6, 58.7 and 88.1 there was 100% compliance with the requirement either to hold offal on board, or to discharge on the opposite side to where the line was hauled. In Subarea 48.3, 76% of the vessels discharged offal on the opposite side to hauling (compared with 71% in 1999); of these vessels 50% did not discharge offal during hauling operations. Three vessels (*Isla Sofia*, *Isla Camila* and *Jacqueline*) have never complied with this element of Conservation Measure 29/XVI (Table 55 and paragraphs 7.53 and 7.54).

(iv) Night setting – compliance improved in Subarea 48.3 from 80% last season to 92% this season, has reduced in Subareas 58.6 and 58.7 from 84% to 72%, and for the new fishery in Division 58.4.4 was only 50% (paragraph 7.55). Several vessels (*Eldfisk*, *Isla Camila*, *Isla Gorriti*, *Magallanes III, No. 1 Moresko* and *Tierra del Fuego*) have fished for at least the last two seasons and consistently failed to comply with this element of the conservation measure (Table 55 and paragraph 7.56).

(v) Line weighting – as in previous years, no vessels complied with line-weighting requirements for Spanish longline systems (6 kg every 20 m) (paragraph 7.58).

(vi) Three vessels which first entered longline fisheries in the Convention Area in 2000, failed to comply with two or more elements of the conservation measure (Table 55 and paragraph 7.60).

Fishing Seasons

7.193 The Commission decision last year to delay the start of longline fishing in Divisions 58.4.3, 58.4.4, 58.5.1, 58.5.2 and Subareas 48.3, 48.4 and 58.6 from 15 April to 1 May probably contributed significantly to the reduction in seabird by-catch in Subarea 48.3 (paragraph 7.63).

Assessment of Incidental Mortality of Seabirds during Unregulated Longline Fishing in the Convention Area

7.194 (i) The estimates of potential seabird by-catch by area for 2000 (paragraphs 7.70 to 7.74, Tables 56 and 57) were:

Subarea 48.3:	1 800–2 400 to 6 500–8 800 seabirds;
Subareas 58.6 and 58.7:	15 400–20 600 to 27 900–37 800 seabirds;
Divisions 58.5.1 and 58.5.2:	7 000–10 300 to 14 100–18 900 seabirds; and
Division 58.4.4:	1 700–3 000 to 2 200–4 100 seabirds.

(ii) The overall estimated totals for the whole Convention Area (paragraph 7.75 and Table 57) indicate a potential seabird by-catch in the unregulated fishery of 26 400–35 300 (lower level) to 50 900–68 300 birds (higher level) in 1999/2000. This compares with totals of 17 000–27 000 (lower level) to 66 000–107 000 (higher level) in 1996/97 and 43 000–54 000 (lower level) to 76 000–101 000 (higher level) in 1997/98 and 21 000–29 000 (lower level) to 44 000–59 000 (higher level) in 1998/99.

(iii) The species composition of the estimated potential seabird by-catch (Table 58) indicates a potential by-catch of 21 900–68 000 albatrosses, 5 000–11 000 giant petrels and 79 000–178 000 white-chinned petrels in the unregulated fishery in the Convention Area over the last four years (paragraph 7.81).

(iv) The Working Group endorsed its conclusion of last year that such levels of mortality are entirely unsustainable for the populations of albatrosses, giant petrels and white-chinned petrels breeding in the Convention Area (paragraph 7.80).

(v) The Scientific Committee was asked to recommend that the Commission take the most stringent measures possible to combat unregulated fishing in the Convention Area (paragraph 7.83).

Incidental Mortality of Seabirds in relation to New and Exploratory Fisheries

7.195 (i) Of the 22 new and exploratory fisheries approved for 1999, only four were operational in 1999/2000; no seabird by-catch was reported for any of these fisheries (in Subareas 58.6 and 88.1, and Division 58.4.4) (paragraphs 7.90 and 7.91).

(ii) The assessment of potential risk of interactions between seabirds and longline fisheries for all statistical areas in the Convention Area was reviewed, revised for Subareas 88.1 and 88.2, and provided as advice to the Scientific Committee and Commission in SC-CAMLR-XVIII/BG/23 (paragraph 7.89).

(iii) The 33 proposals by six Members for new and exploratory longline fisheries in 14 subareas/divisions of the Convention Area in 2000/01 were addressed, in relation to advice in SC-CAMLR-XVIII/BG/23 and Table 59.

(iv) The potential problems identified were:

(a) in proposals by Argentina for Subareas 48.1 and 48.2 and Divisions 58.4.2, 58.5.1 and 58.5.2, the desired fishing season has substantial overlap with the recommended season closure to protect seabirds;

(b) proposals by France (for Divisions 58.4.3, 58.4.4, 58.5.1, 58.5.2 and Subareas 58.6 and 58.7) do not specify a fishing season so cannot be assessed in this important regard; and

(c) in Subarea 88.1 there are important issues relating to exemptions from the night-setting requirements of Conservation Measure 29/XVI (paragraphs 7.94 to 7.103).

Incidental Mortality of Seabirds during
Longline Fishing outside the Convention Area

7.196 (i) The only formal report received related to potential by-catch of black-browed albatrosses (probably from South Georgia) in the Japanese autoliner longline fishery around Tristan da Cunha and Gough Islands (paragraphs 7.104 and 7.105).

(ii) The Working Group again requested reports from Members, for regions adjacent to the Convention Area, on longline fishing effort, on incidental mortality of seabirds and on implementation of mitigating measures (paragraphs 7.111 and 7.112). It also regretted the absence of any feedback to the meeting from CCAMLR observers at meetings of tuna commissions (paragraphs 7.182 and 7.183).

Research into and Experience with Mitigating Measures

7.197 (i) Offal discharge – all vessels operating in the Convention Area should be encouraged either to process offal into fish meal on board, or return all offal to port for onshore processing into fish meal as is the practice by New Zealand (paragraph 7.116); any vessels still discharging offal on the same side as the haul, in contravention of Conservation Measure 29/XVI, should be re-engineered, according to the engineering diagrams of the *Koryo Maru 11* (see SC-CAMLR-XVIII, Annex 5, paragraph 7.110), or prohibited from fishing in the Convention Area.

(ii) Underwater setting – promising results were obtained from trials:

(a) by South Africa, of the Mustad funnel in Subareas 58.6 and 58.7 where, on night-time and daytime sets in summer, seabird by-catch was reduced from 0.013–0.009 and 0.03–0.02 birds/thousand hooks respectively;

(b) by Australia, using a funnel setting at 6 m depth, in its domestic tuna longline fishery, eventually resulting in zero seabird by-catch (paragraph 7.119); and

(c) by Norway, in domestic longline fisheries, where setting funnels reduced the by-catch of northern fulmars by 72% (paragraphs 7.120 and 7.121).

(iii) Streamer lines – the importance of adhering, as a minimum, to the specifications set out in Conservation Measure 29/XVI was re-emphasised; some potential modifications, to enhance performance, were recommended for testing (paragraphs 7.123 to 7.125).

(iv) Line weighting – New Zealand vessels operating in Subarea 88.1 successfully achieved the required experimental line sink rates (WG-FSA-00/58 and paragraph 7.128); some further trials, however, are required before a weighting regime for autoliners can be incorporated into Conservation Measure 29/XVI (paragraph 7.148).

(v) Pots – no seabird by-catch had been reported in association with the experimental use of pots to catch toothfish (WG-FSA-00/23 and paragraph 7.129).

(vi) Other – trials by New Zealand of a laser gun and aircraft spotlights had been unsuccessful.

Policy Considerations in relation to Mitigating Measures and Conservation Measure 29/XVI

7.198 Conservation Measure 29/XVI is the key element in minimisation of incidental mortality of seabirds during longlining in the Convention Area. Compliance is still substantially deficient, particularly in some key elements. Improving the current situation requires:

(i) further development of underwater setting, which offers the most likely medium- to long-term solution to the problem;

(ii) work to develop line-weighting regimes to ensure sink rates that will preclude seabirds accessing bait. This offers the best short-term solution, as well as the likelihood of permitting exemption from several other mitigating measures currently in use in the Convention Area; and

(iii) in the meantime, better compliance with the existing suite of mitigation measures in Conservation Measure 29/XVI is essential (paragraphs 7.134 and 7.135).

7.199 The main issues relating to compliance with Conservation Measure 29/XVI are:

(i) how to get fishers to comply with the straightforward elements of the conservation measure, in respect of offal discharge, streamer lines and night setting;

(ii) how to tackle the consistent inability of vessels to comply with the element of the conservation measure that specifies the line-weighting regime for Spanish system longliners; and

(iii) how to develop the requirements for an appropriate line-weighting regime for autoliners (paragraph 7.136).

7.200 To address these problems, the Working Group provided some detailed comments and practical suggestions (paragraphs 7.138 to 7.150) and advises that:

(i) given the simplicity of complying with the elements of Conservation Measure 29/XVI relating to offal discharge, night setting and streamer lines, vessels unable, or failing, to comply with these elements should be prohibited from fishing in the Convention Area; this should be emphasised to technical coordinators, fishing companies and national authorities at the earliest opportunity (paragraphs 7.151 to 7.153);

(ii) in circumstances where all other elements of Conservation Measure 29/XVI apply (e.g. in respect of night setting, streamer lines and offal discharge) and with appropriate closed seasons, the line-weighting regime for the Spanish system of longlining should be set at weights of a minimum of 8.5 kg spaced at no more than 40 m intervals (paragraph 7.146);

(iii) once experimental trials of autoline weighting are completed in Subarea 88.1 and similar trials have been carried out in areas of higher risk to seabirds, the Working Group should be able to recommend a line weighting for autoline vessels that will have utility for all subareas of the Convention Area (paragraph 7.148);

(iv) the ultimate aim in managing seabird by-catch in the Convention Area will be to allow fishing at any time of day without seasonal closure of fishing grounds. However, current indications are that allowing fishing in summer, at night, using streamer lines, proper offal discharge practices and c. 40 m between weights on longlines (existing practice for Spanish system vessels), will still result in unacceptably high mortality of seabirds. Clearly, more time is required to allow experimentation into the effectiveness of line-weighting concepts and underwater setting devices with the Spanish system that will reduce seabird by-catch and be more acceptable to the fishing industry. In the meantime, seabird by-catch in the Convention Area should be managed in accordance with practices adopted in Subarea 48.3, where a combination of a closed season in

summer, night setting, the use of streamer lines and proper offal discharge practices has effectively solved the seabird by-catch problem (paragraphs 7.149 and 7.150).

International and National Initiatives relating to Incidental Mortality of Seabirds in relation to Longline Fishing

7.201 (i) FAO–NPOAs – New Zealand and USA had draft plans available for consultation; Australia's TAP contained the essence of its NPOA (which would be prepared in due course); Brazil and Chile were commencing to prepare plans; the European Community had started the assessment process (paragraphs 7.160 to 7.169).

(ii) Regional Agreement for the Conservation of Albatrosses under the CMS – considerable progress had been made at an initial meeting in Hobart, Australia, in July 2000; the details of the Action Plan are under consultation; a second meeting is planned in South Africa in early 2001. This agreement has very substantial implications for the conservation of seabirds in marine and terrestrial ecosystems; all Members of CCAMLR should participate actively in the meetings, especially by facilitating the attendance of appropriate technical and scientific experts (paragraphs 7.170 to 7.178).

(iii) New Zealand's International Fishers' Forum on Solving the Incidental Capture of Seabirds in Longline Fisheries is to be held the week after the CCAMLR Commission meeting; Members longlining in the Convention Area were encouraged to facilitate the participation of other scientists, fishery managers and fishers (paragraphs 7.179 to 7.181).

(iv) Uruguayan and Brazilian scientists will convene a BirdLife International workshop in Montevideo, Uruguay, in 2001 to address issues relating to seabird by-catch in South America (paragraphs 7.156 and 7.157).

Table 9: Summary of observations on longline fisheries conducted in the 1999/2000 season by scientific observers.

Flag State	Vessel	Fishing Method	Observer	Subarea / Fishery	Period of Observation	Report / Date Submitted	Data Reported
Chile	*Faro de Hercules*	LLS Spanish	P. Wright UK	48.3 *D. eleginoides*	18/5–27/7/00	Scientific Observer Logbook 18/9/00 Cruise Report 12/9/00	Cruise, vessel, and IMALF details
Chile	*Isla Camila*	LLS Spanish	A. Williams UK	48.3 *D. eleginoides*	15/4–27/7/00	Scientific Observer Logbook 18/9/00 Cruise Report 12/9/00	Cruise, vessel, and IMALF details
Chile	*Isla Santa Clara*	LLS Spanish	R. Gater UK	48.3 *D. eleginoides*	12/4–27/7/00	Scientific Observer Logbook 31/8/00 Cruise Report 12/9/00	Cruise, vessel, and IMALF details
Chile	*Isla Sofía*	LLS Spanish	C. Herrera Argentina	48.3 *D. eleginoides*	20/6–21/7/00	Scientific Observer Logbook 28/8/00 Cruise Report 29/8/00	Cruise, vessel, and IMALF details
Chile	*Magallanes III*	LLS Spanish	P. Wright UK	48.3 *D. eleginoides*	23/4–18/5/00	Scientific Observer Logbook 18/9/00 Cruise Report 12/5/00	Cruise, vessel, and IMALF details
Chile	*Magallanes III*	LLS Spanish	M. Lozano Uruguay	48.3 *D. eleginoides*	10/7–21/7/00	Cruise Report 12/9/00	Cruise details
Chile	*Tierra del Fuego*	LLS Spanish	M. Murphy UK	48.3 *D. eleginoides*	1/5–21/7/00	Scientific Observer Logbook 13/8/00 Cruise Report 28/9/00	Cruise, vessel, and IMALF details
France	*Cap Kersaint*	LLS Spanish	D. Capdeville France	58.6 *D. eleginoides*	9/7–19/7/00	Scientific Observer Logbook 19/9/00	Cruise, vessel, and IMALF details
France	*Croix de Sud I*	LLS Auto	N. Gasco France	58.6 *D. eleginoides*	28/7–31/7/00	Scientific Observer Logbook 19/9/00	Cruise, vessel, and IMALF details
UK	*Argos Georgia*	LLS Spanish	M. Purves South Africa	48.3 *D. eleginoides*	18/5–28/7/00	Scientific Observer Logbook 18/9/00 Cruise report 12/9/00	Cruise, vessel, and IMALF details
UK	*Argos Helena*	LLS Spanish	Y. Marín Uruguay	48.3 *D. eleginoides*	1/5–21/7/00	Cruise report 2/10/00	Cruise details
UK	*Jacqueline*	LLS Spanish	C. Vera Cárdenas Chile	48.3 *D. eleginoides*	1/5–21/7/00	Scientific Observer Logbook 13/9/00 Cruise Report 25/9/00	Cruise, vessel, and IMALF details
UK	*Lyn*	LLS Spanish	P. Casas–Cordero Chile	48.3 *D. eleginoides*	1/5–21/7/00	Scientific Observer Logbook 13/9/00 Cruise Report 25/9/00	Cruise, vessel, and IMALF details
New Zealand	*Janas*	LLS Auto	J. Wium South Africa	88.1 *Dissostichus* spp.	4/1–24/3/00	Scientific Observer Logbook 6/7/00 Cruise Report 3/7/00	Cruise, vessel, and IMALF details

(continued)

Table 9 (continued)

Flag State	Vessel	Fishing Method	Observer	Subarea / Fishery	Period of Observation	Report / Date Submitted	Data Reported
New Zealand	*San Aotea II*	LLS Auto	F. Stoffberg South Africa	88.1 *Dissostichus* spp.	3/1–18/3/00	Scientific Observer Logbook 6/7/00 Cruise Report 3/7/00	Cruise, vessel, and IMALF details
New Zealand	*Sonrisa*	LLS Auto	B. Fairhead South Africa	88.1 *Dissostichus* spp.	21/1–7/3/00	Scientific Observer Logbook 6/7/00 Cruise Report 27/4/00	Cruise, vessel, and IMALF details
Republic of Korea	*No. 1 Moresko*	LLS Spanish	S. Hutton UK	48.3 *D. eleginoides*	26/4–21/7/00	Scientific Observer Logbook 18/7/00 Cruise Report 12/7/00	Cruise, vessel, and IMALF details
South Africa	*Aquatic Pioneer*	LLS Spanish	P. Nel* South Africa	58.7 *D. eleginoides*	23/8–5/10/99	Scientific Observer Logbook 6/11/99 Cruise Report 20/12/99	Cruise, vessel, and IMALF details
South Africa	*Aquatic Pioneer*	LLS Spanish	M. Davies* South Africa	58.6 *D. eleginoides*	9/10–10/12/99	Scientific Observer Logbook 1/2/00 Cruise Report 1/2/00	Cruise, vessel, and IMALF details
South Africa	*Aquatic Pioneer*	LLS Spanish	E. Simpson* South Africa	58.6, 58.7 *D. eleginoides*	17/1–15/3/00	Scientific Observer Logbook 27/4/00 Cruise Report 27/4/00	Cruise, vessel, and IMALF details
South Africa	*Aquatic Pioneer*	LLS Spanish	H. Crous* South Africa	58.6, 58.7 *D. eleginoides*	29/3–11/5/00	Scientific Observer Logbook 3/7/00 Cruise Report 3/7/00	Cruise, vessel, and IMALF details
South Africa	*Aquatic Pioneer*	LLS Spanish	R. Pienaar* South Africa	58.6, 58.7 *D. eleginoides*	13/7–8/9/00	Cruise Report 28/9/00	Cruise details
South Africa	*Eldfisk*	LLS Auto	B. Fairhead* South Africa	58.7 *D. eleginoides*	26/7–1/10/99	Scientific Observer Logbook 27/4/00 Cruise Report 26/11/99	Cruise, vessel, and IMALF details
South Africa	*Eldfisk*	LLS Auto	Crous, Enticott* South Africa	58.6, 58.7 *D. eleginoides*	8/10–17/12/99	Scientific Observer Logbook 1/2/00 Cruise Report 1/2/00	Cruise, vessel, and IMALF details
South Africa	*Eldfisk*	LLS Auto	Davies, Dyer* South Africa	58.6, 58.7 *D. eleginoides*	5/1–17/3/00	Scientific Observer Logbook 27/4/00 Cruise Report 27/4/00	Cruise, vessel, and IMALF details
South Africa	*Eldfisk*	LLS Auto	Fairhead, Koen* South Africa	58.6, 58.7 *D. eleginoides*	23/3–2/6/00	Scientific Observer Logbook 3/7/00 Cruise Report 3/7/00	Cruise, vessel, and IMALF details
South Africa	*Eldfisk*	LLS Auto	Stoffberg, Davies* South Africa	58.6, 58.7 *D. eleginoides*	16/6–23/8/00	Cruise Report 28/9/00	Cruise details
South Africa	*Koryo Maru 11*	LLS Spanish	G. Westhuizen* South Africa	58.6, 58.7 *D. eleginoides*	16/10–10/11/99	Scientific Observer Logbook 1/2/00 Cruise Report 1/2/00	Cruise, vessel, and IMALF details

(continued)

Table 9 (continued)

Flag State	Vessel	Fishing Method	Observer	Subarea / Fishery	Period of Observation	Report / Date Submitted	Data Reported
South Africa	*Koryo Maru 11*	LLS Spanish	B. Stander* South Africa	58.6, 58.7 *D. eleginoides*	16/1–7/4/00	Scientific Observer Logbook 3/7/00 Cruise Report 3/7/00	Cruise, vessel, and IMALF details
South Africa	*Koryo Maru 11*	LLS Spanish	P. Usher UK	48.3 *D. eleginoides*	18/4–2/7/00	Scientific Observer Logbook 18/9/00 Cruise Report 18/9/00	Cruise, vessel, and IMALF details
Spain	*Ibsa Quinto*	LLS Spanish	M. Endicott UK	48.3 *D. eleginoides*	23/4–21/7/00	Scientific Observer Logbook 18/9/00 Cruise Report 12/9/00	Cruise, vessel, and IMALF details
Ukraine	*RK-1*	LLS Auto	L. Fearnhough UK	48.3 *D. eleginoides*	25/4–24/7/00	Scientific Observer Logbook 31/8/00 Cruise Report 12/9/00	Cruise, vessel, and IMALF details
Uruguay	*Illa de Rua*	LLS Spanish	J. Bailey UK	48.3 *D. eleginoides*	14/4–25/7/00	Scientific Observer Logbook 31/8/00 Cruise Report 12/9/00	Cruise, vessel, and IMALF details
Uruguay	*Isla Alegranza*	LLS Spanish	H. Pavez Chile	58.4.4 *D. eleginoides*	26/6–30/8/00	Scientific Observer Logbook 30/9/00 Cruise Report 2/10/00	Cruise, vessel, and IMALF details
Uruguay	*Isla Gorriti*	LLS Auto	M. Keen UK	48.3 *D. eleginoides*	18/4–22/7/00	Scientific Observer Logbook 31/8/00 Cruise Report 12/9/00	Cruise, vessel, and IMALF details

* National observers, deployed within national EEZs

Table 47: Summary of seabirds at risk from longline fisheries in the Convention Area indicating the populations where population monitoring (PM) and foraging ecology (FE) studies are currently being undertaken (information extracted from documents cited in SC-CAMLR-XVIII, Annex 5, paragraph 7.7; also Gales, 1998; Marchant and Higgins, 1990).

Species	Species Status[1]	Study Location	Annual Pairs	Year Commenced	Objectives PM	Objectives FE
Wandering albatross	Vulnerable	South Georgia	2 178	1972	√	√
Diomedea exulans		Crozet	1 734	1966	√	√
		Kerguelen	1 455	1973	√	√
		Macquarie	10	1994	√	
				1998		√
		Marion	1 794	1979	√	√
		Prince Edward	1 277			
Antipodean albatross	Vulnerable	Auckland	65	1991	√	√
Diomedea antipodensis		Adams	5 762			
		Antipodes	5 148	1994	√	√
Amsterdam albatross	Critically	Amsterdam	13	1983	√	√
Diomedea amsterdamensis	Endangered					
Southern royal albatross	Vulnerable	Campbell	7 800	1995	√	√
Diomedea epomophora						
Northern royal albatross	Endangered	Chatham	5 200	1990s	√	√
Diomedea sanfordi		Taiaroa	18	1950s	√	√
				1993		√
Grey-headed albatross	Vulnerable	South Georgia	54 218	1976	√	√
Diomedea chrysostoma		Diego Ramirez	10 000	1999	√	√
		Macquarie	84	1994	√	
				1999		√
		Campbell	6 400	1987	√	
				1995		√
		Marion	6 217	1984	√	√
		Prince Edward	1 500			
		Kerguelen	7 900			
Black-browed albatross	Near	South Georgia	96 252	1976	√	√
Diomedea melanophrys	Threatened	Falklands/Malvinas	550 000	1990	√	
				1998		√
		Diego Ramirez	32 000	1999	√	√
		Kerguelen	3 115	1978	√	√
		Macquarie	38	1994	√	
				1999		√
		Antipodes	100	1995	√	
		Heard, McDonald	750			
		Crozet	980			
Campbell albatross	Vulnerable	Campbell	26 000	1987	√	
Diomedea impavida				1995		√
Indian yellow-nosed albatross	Vulnerable	Amsterdam	25 000	1978	√	√
Diomedea chlororhynchos		Prince Edward	7 000			
		Crozet	4 430			

(continued)

Table 47 (continued)

Species	Species Status[1]	Study Location	Annual Pairs	Year Commenced	Objectives PM	Objectives FE
Buller's albatross	Vulnerable	Snares	8 460	1992	√	√
Thalassarche bulleri		Solander	4 000–5 000	1992	√	√
Chatham albatross	Critically	Chatham	4 000	1998		√
Thalassarche eremita	Endangered					
Salvin's albatross	Vulnerable	Bounty	76 000	1998	√	
Thalassarche salvini		Snares	650			
White-capped albatross	Vulnerable	Antipodes	75	1995	√	
Thalassarche steadi		Disappointment	72 000			
		Adams	100			
		Auckland	3 000			
Light-mantled albatross	Near	Macquarie	1 100	1993	√	
Phoebetria palpebrata	Threatened			1998		√
		Crozet	2 151	1966	√	√
		South Georgia	6 500			
		Marion	201			
		Kerguelen	3 000–5 000	1994	√	
		Heard, McDonald	500-700			
		Auckland	5 000			
		Campbell	>1 500	1995	√	
		Antipodes	<1 000			
Sooty albatross	Vulnerable	Crozet	2 298	1968	√	√
Phoebetria fusca		Amsterdam	300-400	1992	√	√
		Tristan da Cunha	2 750			
		Gough	5 000–10 000	2 000	√	√
		Prince Edward	700			
		Marion	2 055			
Southern giant petrel	Vulnerable	South Georgia	5 000	1980	√	
Macronectes giganteus				1998		√
		Macquarie	2 300	1994	√	
		Crozet	1 017	1981	√	
		Marion		1984	√	√
		Adélie Land	9–11	1964	√	
		South Sandwich	800			
		Gough				
		Prince Edward	3 000			
		Kerguelen	3–5			
		Heard	2 350			
		South Orkney	8 755	1976	√	
		South Shetland	7 185			
		Enderby Land	no estimate			
		Frazier	250			
		Antarctic Peninsula	1 125			
		Falklands/Malvinas	5 000			

(continued)

Table 47 (continued)

Species	Species Status[1]	Study Location	Annual Pairs	Year Commenced	Objectives PM	Objectives FE
Northern giant petrel	Near	South Georgia	3 000	1980	√	
Macronectes halli	Threatened		1 280	1998		√
		Macquarie	1 313	1994	√	
		Crozet		1981	√	
		Marion	500	1984	√	√
		Prince Edward				
		Kerguelen	1 450–1 800	1986	√	
		Auckland	no estimate			
		Campbell	230+			
		Antipodes	320			
		Chatham	no estimate			
White-chinned petrel	Vulnerable	South Georgia	2 000 000	1995–98	√	√
Procellaria aequinoctialis		Crozet	10 000s	1968	√	√
		Prince Edward	10 000s	1996	√	√
		Falklands/Malvinas	1 000–5 000			
		Kerguelen	100 000s			
		Auckland, Campbell, Antipodes	10 000–50 000			
Grey petrel	Near	Gough	100 000s			
Procellaria cinerea	Threatened	Tristan da Cunha	1 000s			
		Prince Edward	1 000s			
		Crozet	1 000s			
		Kerguelen	1 000s			
		Campbell	10 000s			
		Antipodes	10 000s			
		Macquarie	<100			

[1] As classified using IUCN criteria for threatened species. (Birdlife International. 2000. *Threatened Birds of the World.* BirdLife International/Lynx-Edicions, Barcelona; see WG-FSA-00/34).

Table 48: Incidental mortality of seabirds in the longline fisheries for *Dissostichus eleginoides* in Subareas 48.3, 58.6, 58.7 and 88.1 during the 1998/99 season. Sp – Spanish method; Auto – autoliner; N – night-time setting; D – daytime setting (including nautical dawn and dusk); O – opposite side to hauling; S – same side as hauling. * – Data obtained from observer cruise reports.

Vessel	Dates of Fishing	Fishing Method	Sets Deployed				No. of Hooks (thousands)			Hooks Baited	No. of Birds Caught						Observed Seabird Mortality (birds/1 000 hooks)			Streamer Line in Use		Offal Discharge During Haul (%)
									%	%	Dead		Alive		Total					%		
			N	D	Total	%N	Obs.	Set	Observed		N	D	N	D	N	D	N	D	Total	N	D	
Subarea 48.3																						
Argos Georgia	1/6–20/7/00	Sp	153	4	157	97	234.1	586.5	39	100	0	0	0	0	0	0	0	0	0	83	100	O (100)
*Argos Helena**	1/5-21/7/00	Sp									0	0	0	0	0	0	0	0	0			
Faro de Hercules	18/5–21/7/00	Sp	114	5	119	96	163.0	784.8	20	100	0	0	4	0	4	0	0	0	0	90	100	S (0)
Ibsa Quinto	2/5–21/7/00	Sp	117	9	126	93	149.7	1360.0	11	99	0	0	0	0	0	0	0	0	0	89	88	O (94)
Illa de Rua	1/5–20/7/00	Sp	163	4	167	97	357.2	1725.2	20	100	0	0	16	0	16	0	0	0	0	97	100	O (59)
Isla Camila	1/5–15/6/00	Sp	141	23	164	86	293.7	1072.4	27	100	0	0	5	0	5	0	0	0	0	98	100	S (100)
Isla Gorriti	1/5–19/7/00	Auto	129	27	156	83	371.9	1362.6	27	98	0	1	0	0	0	1	0	0.019	0.003	96	100	O (100)
Isla Santa Clara	1/5–20/7/00	Sp	148	20	168	88	381.4	1330.2	28	96	2	2	0	0	2	2	0.006	0.044	0.01	53	100	O (95)
Isla Sofía	20/6–18/7/00	Sp	50	0	50	100	111.4	367.8	30	100	0	0	6	0	6	0	0	0	0	100		S (0)
Jacqueline	6/5–20/7/00	Sp	88	12	100	88	347.8	1101.8	31	100	1	0	0	0	1	0	0.003	0	0.003	62	100	S (100)
Koryo Maru 11	1/5–21/7/00	Sp	91	2	93	98	174.7	1118.1	15	99	0	0	0	0	0	0	0	0	0	100	100	O (88)
Lyn	2/5–20/7/00	Sp	115	0	115	100	144.2	1140.3	12	100	0	0	8	0	8	0	0	0	0	100		O (0)
Magallanes III	2/5–9/5/00	Sp	13	2	15	87	23.8	110.3	21	100	0	0	0	0	0	0	0	0	0	92	100	O (0)
*Magallanes III**	7/7–14/7/00	Sp									0	0	0	0	0	0	0	0	0			
No. 1 Moresko	2/5–21/7/00	Sp	100	27	127	79	301.2	1120.8	26	100	0	0	0	0	0	0	0	0	0	99	96	O (98)
RK-1	1/5–20/7/00	Auto	251	20	271	92	210.6	860.0	24	85	0	0	0	0	0	0	0	0	0	14	25	O (98)
Tierra del Fuego	1/5–21/7/00	Sp	131	28	159	82	192.9	668.3	28	95	0	0	0	1	0	1	0	0	0	87	85	O (92)
Total						87	3457.6	14709.1	24								0.0002	0.002	0.0004			
Division 58.4.4																						
Isla Alegranza	26/6–30/8/00	Sp	34	34	68	50	178.8	704.9	25	100	0		0		0		0	0	0	20	85	S (100)
Subareas 58.6, 58. 7																						
Aquatic Pioneer	30/8–28/9/99	Sp	33	0	33	100	129.4	215.0	60	63	3	0	0	0	3	0	0.023	0	0.023	93		O (80)
Aquatic Pioneer	15/10– 3/12/99	Sp	29	22	51	57	380.0	585.3	64	64	19	9	10	1	29	10	0.098	0.048	0.074	93	90	O (96)
Aquatic Pioneer	24/1–11/3/00	Sp	44	0	44	100	54.6	506.0	10	79	17	0	2	0	19	0	0.311	0	0.311	97		O (98)
Aquatic Pioneer	3/4–4/5/00	Sp	31	0	31	100	98.5	356.2	27	75	12	0	1	0	13	0	0.122	0	0.122	100		O (100)
*Aquatic Pioneer**	18/7–1/9/00	Sp					63.7	528.1	12		0	0	0	0	0	0	1	0	0			
Cap Kersaint	8/7–15/7/00	Sp	5	0	5	100	4.2	41.0	10	100	0	0	0	0	0	0	0	0	0	60		O (100)
Croix du Sud I	28/7–31/7/00	Auto	2	0	2	100	19.9	23.1	85	90	0	0	0	0	0	0	0	0	0	0		
Eldfisk	1/8–27/9/99	Auto	245	75	320	77	301.7	968.3	31	90	2	0	0	0	2	0	0.008	0	0.007	100	100	O (100)
Eldfisk	13/10–12/12/99	Auto	128	165	293	44	786.0	858.9	91	90	34	5	1	0	35	5	0.101	0.011	0.050	98	100	O (80)
Eldfisk	10/1–12/3/00	Auto	81	228	309	26	160.9	935.3	17	83	14	9	3	6	17	15	0.262	0.084	0.143	100	99	O (70)

(continued)

Table 48 (continued)

Vessel	Dates of Fishing	Fishing Method	Sets Deployed				No. of Hooks (thousands)			Hooks Baited	No. of Birds Caught						Observed Seabird Mortality (birds/1 000 hooks)			Streamer Line in Use		Offal Discharge During Haul (%)
									%		Dead		Alive		Total					%		
			N	D	Total	%N	Obs.	Set	Observed	%	N	D	N	D	N	D	N	D	Total	N	D	
Subareas 58.6, 58. 7 continued																						
Eldfisk	28/3–27/5/00	Auto	95	211	306	31	530.0	915.4	57	86	0	3	0	0	0	3	0	0.008	0.006	98	99	O (100)
*Eldfisk**	16/6–16/8/00	Auto					324.8	676.8	48		4		3		7				0.012			
Koryo Maru 11	25/8–28/9/00	Sp	99	1	100	99	366.0	806.5	45	100	2	0	3	0	5	0	0.005	0	0.005	98	100	O (100)
Koryo Maru 11	16/1– 31/3/00	Sp	108	15	123	88	223.0	844.8	26	99	20	6	11	3	31	9	0.104	0	0.117	99	93	O (100)
Total						77	3442.1	8260.7	42								0.027	0.013	0.022			
Subarea 88.1																						
Janus	13/1–15/3/00	Auto	6	184	190	3	302.2	952.5	31	91	0	0	0	0	0	0	0	0	0	100	100	(0)
San Aotea II	13/1–14/3/00	Auto	32	177	209	15	293.4	997.0	29	88	0	0	0	0	0	0	0	0	0	87	100	S (0)
Sonrisa	30/1–27/2/00	Auto	0	86	86	0	108.6	184.3	58	87	0	0	0	0	0	0	0	0	0		97	(0)
Total						6	704.2	2133.8	33								0	0	0			

Table 49: Estimated seabird mortality by vessel for Subarea 48.3 during the 1999/2000 season. * – Data obtained from observer cruise report.

Vessel	Hooks Observed (thousands)	Hooks Set (thousands)	Percentage of Hooks Observed	% Night Sets	Estimated Number of Birds Caught Dead		
					Night	Day	Total
Argos Georgia	234.1	586.5	39	97	0	0	0
*Argos Helena**					0	0	0
Faro de Hercules	163.0	784.8	20	96	0	0	0
Ibsa Quinto	149.7	1 360.0	11	11	0	0	0
Illa de Rua	357.2	1 725.2	20	97	0	0	0
Isla Camila	293.7	1 072.4	27	86	0	0	0
Isla Gorriti	371.9	1 362.6	27	83	0	4	4
Isla Santa Clara	381.4	1 330.2	28	88	7	7	14
Isla Sofía	111.4	367.8	30	100	0	0	0
Jacqueline	347.8	1 101.8	31	88	3	0	3
Koryo Maru 11	174.7	1 118.1	15	98	0	0	0
Lyn	144.2	1 140.3	12	100	0	0	0
Magallanes III	23.8	110.3	21	21	0	0	0
*Magallanes III**					0	0	0
No. 1 Moresko	301.2	1 120.8	26	26	0	0	0
RK-1	210.6	860.0	24	92	0	0	0
Tierra del Fuego	192.9	668.3	28	82	0	0	0
Total	3 156.4	13 588.3	24	87	10	11	21

Table 50: Species composition of birds killed in longline fisheries in Subareas 48.3, 58.6 and 58.7 during the 1999/2000 season. N – night setting; D – daylight setting (including nautical dawn and dusk); DIM – black-browed albatross; DIC – grey-headed albatross; MAI – southern giant petrel; PRO – white-chinned petrel; MAH – northern giant petrel; DAC – cape petrel; DCR – yellow-nosed albatross; PCI – grey petrel; ( ) – % composition; * – Data obtained from observer cruise report.

Vessel	Dates of Fishing	No. Birds Killed by Group						Species Composition (%)							
		Albatross		Petrels		Total									
		N	D	N	D	N	D	DIM	DIC	MAI	PRO	MAH	DAC	DCR	PCI
Subarea 48.3															
Argos Georgia	1/6–20/7/00	0	0	0	0	0	0								
*Argos Helena**	1/5–21/7/00	0	0	0	0	0	0								
Faro de Hercules	18/5– 21/7/00	0	0	0	0	0	0								
Ibsa Quinto	2/5–21/7/00	0	0	0	0	0	0								
Illa de Rua	1/5–20/7/00	0	0	0	0	0	0								
Isla Camila	1/5–15/6/00	0	0	0	0	0	0								
Isla Gorriti	1/5–19/7/00	0	1	0	0	0	1	1 (100)							
Isla Santa Clara	1/5–20/7/00	0	0	2	2	2	2			2 (50)		1 (25)	1 (25)		
Isla Sofía	20/6–18/7/00	0	0	0	0	0	0								
Jacqueline	6/5–20/7/00	0	0	1	0	1	0			1 (100)					
Koryo Maru 11	1/5–21/7/00	0	0	0	0	0	0								
Lyn	2/5–20/7/00	0	0	0	0	0	0								
Magallanes III	2/5–9/5/00	0	0	0	0	0	0								
*Magallanes III**	7/7–14/7/00	0	0	0	0	0	0								
No. 1 Moresko	2/5–21/7/00	0	0	0	0	0	0								
RK-1	1/5–20/7/00	0	0	0	0	0	0								
Tierra del Fuego	1/5–21/7/00	0	0	0	0	0	0								
Total %								1 (16.5)		3 (50)		1 (16.5)	1 (16.5)		
Subareas 58.6, 58.7															
Aquatic Pioneer	30/8–28/9/99	0	0	3	0	3	0			1 (33.3)		1 (33.3)			1 (33.3)
Aquatic Pioneer	15/10–3/12/99	0	0	19	9	19	9				28 (100)				
Aquatic Pioneer	24/1–11/3/00	0	0	17	0	17	0				17 (100)				
Aquatic Pioneer	3/4–4/5/00	0	0	12	0	0	0				12 (100)				
*Aquatic Pioneer**	18/7–1/9/00	0	0	0	0	0	0								
Cap Kersaint	8/7–15/7/00	0	0	0	0	0	0								
Croix du Sud I	28/7–31/7/00	0	0	0	0	0	0								
Eldfisk	1/8–27/9/99	0	0	2	0	2	0								2 (100)
Eldfisk	13/10–12/12/99	0	0	34	5	34	5				39 (100)				
Eldfisk	10/1–12/3/00	0	6	14	3	14	9		1 (4)		17 (74)			5 (22)	
Eldfisk	28/3–27/5/00	0	1	0	2	0	3		1 (33.3)		2 (66.6)				
*Eldfisk**	16/6–16/8/00	2		2		4			2 (50)	1 (25)					1 (25)
Koryo Maru 11	25/8–28/9/00	0	0	2	0	2	0				2 (100)				
Koryo Maru 11	16/1–31/3/00	0	0	20	6	20	6				26 (100)				
Total %									4 (2.5)	2 (1)	143 (90)	1 (1)		5 (3)	4 (2.5)

Table 51: Estimated seabird mortality by vessel for Subareas 58.6 and 58.7 during the 1999/2000 season. * – Data obtained from observer cruise report.

Vessel	Hooks Observed (thousands)	Hooks Set (thousands)	Percentage of Hooks Observed	% Night Sets	Estimated Number of Birds Caught Dead		
					Night	Day	Total
Aquatic Pioneer	129.4	215.0	60	100	5	0	5
Aquatic Pioneer	380.0	585.3	64	57	33	12	45
Aquatic Pioneer	54.6	506.0	10	100	157	0	157
Aquatic Pioneer	98.5	356.2	27	100	43	0	43
*Aquatic Pioneer**	63.7	528.1	12		0	0	0
Cap Kersaint	4.2	41.0	10	100	0	0	0
Croix du Sud I	19.9	23.1	85	100	0	0	0
Eldfisk	301.7	968.3	31	77	6	0	6
Eldfisk	786.0	858.9	91	44	38	5	43
Eldfisk	160.9	935.3	17	26	64	58	122
Eldfisk	530.0	915.4	57	31	0	5	5
*Eldfisk**	324.8	676.8	48		6	2	8
Koryo Maru 11	366.0	806.5	45	99	4	0	4
Koryo Maru 11	223.0	844.8	26	88	77	0	77
Total	3 030.1	6 991.7	42	72.20	434	83	516

Table 52: Total estimated seabird by-catch and by-catch rate (birds/thousand hooks) in longline fisheries in Subareas 48.3, 58.6 and 58.7, from 1997 to 2000.

Subarea	Year			
	1997	1998	1999	2000
48.3				
Estimated by-catch	5 755	640	210*	21
By-catch rate	0.23	0.03	0.01*	0.0004
58.6, 58.7				
Estimated by-catch	834	528	156	516
By-catch rate	0.52	0.19	0.03	0.022

* Excluding *Argos Helena* line-weighting experiment cruise.

Table 53: Summary of compliance with Conservation Measure 29/XVI, based on data from scientific observers, for 1996/97, 1997/98, 1998/99 and 1999/2000. Values in parentheses are % of observer records that were complete.

Subarea/ Time	Line Weighting (Spanish System Only)			Night Setting	Offal Discharge	Streamer Line Compliance (%)										Total Catch Rate (birds/1 000 hooks)	
	Compliance %	Median Weight (kg)	Median Spacing (m)	(% Night)	(%) Opposite Haul	Overall		Attached Height		Length		No. Streamers		Distance Apart		Night	Day
Subarea 48.3																	
1996/97	0 (91)	5	45	81	0 (91)	6	(94)	47	(83)	24	(94)	76	(94)	100	(78)	0.18	0.93
1997/98	0 (100)	6	42.5	90	31 (100)	13	(100)	64	(93)	33	(100)	100	(93)	100	(93)	0.03	0.04
1998/99	5 (100)	6	43.2	80[1]	71 (100)	0	(95)	84	(90)	26	(90)	76	(81)	94	(86)	0.01	0.08[1]
1999/2000	1 (91)	6	44	92	76 (100)	31	(94)	100	(65)	25	(71	100	(65)	85	(76)	<0.01	<0.01
Division 58.4.4																	
1999/2000	0 (100)	5	45	50	0 (100)	0	(100)	100	(100)	0	(100)	Y	(100)	100	(100)	0	0
Subareas 58.6, 58.7																	
1996/97	0 (60)	6	35	52	69 (87)	10	(66)	100	(60)	10	(66)	90	(66)	60	(66)	0.52	0.39
1997/98	0 (100)	6	55	93	87 (94)	9	(92)	91	(92)	11	(75)	100	(75)	90	(83)	0.08	0.11
1998/99	0 (100)	8	50	84[2]	100 (89)	0	(100)	100	(90)	10	(100)	100	(90)	100	(90)	0.05	0
1999/2000	0 (83)	6	88	72	100 (93)	8	(100)	91	(92)	0	(92)	100	(92)	91	(92)	0.03	0.01
Subarea 88.1																	
1996/97	Auto only	na	na	50	0 (100)	100	(100)	100	(100)	100	(100)	100	(100)	100	(100)	0	0
1997/98	Auto only	na	na	71	0 (100)	100	(100)	100	(100)	100	(100)	100	(100)	100	(100)	0	0
1998/99	Auto only	na	na	1[3]	100 (100)	100	(100)	100	(100)	100	(100)	100	(100)	100	(100)	0	0
1999/2000	Auto only	na	na	6[4]	No discharge	67[5]	(100)	100	(100)	67[5]	(100)	100	(100)	100	(100)	0	0

[1] Includes daytime setting – and associated seabird by-catch – as part of line-weighting experiments on *Argos Helena* (WG-FSA-99/5).
[2] Includes some daytime setting in conjunction with use of an underwater-setting funnel on *Eldfisk* (WG-FSA-99/42).
[3] Conservation Measure 169/XVII allowed New Zealand vessels to undertake daytime setting south of 65°S in Subarea 88.1 to conduct a line-weighting experiment.
[4] Conservation Measure 190/XVIII allowed New Zealand vessels to undertake daytime setting south of 65°S in Subarea 88.1 to conduct a line-weighting experiment.
[5] In electronic form only; the written report to CCAMLR and the report of the New Zealand national observer both gave a value of 150 m.

Table 54: Compliance, as reported by scientific observers, with streamer line minimum specifications set out in Conservation Measure 29/XVI during the 1999/2000 season. Nationality: CHL – Chile, ESP – Spain, GBR – United Kingdom, KOR – Republic of Korea, NZL – New Zealand, UKR – Ukraine, URY – Uruguay, ZAF – South Africa; Fishing method: A – autoliner, Sp – Spanish system; Y – yes, N – no, - no information.

Vessel Name (Nationality)	Dates of Trip	Fishing Method	Compliance with CCAMLR Specifications	Compliance with Details of Streamer Line Specifications										Spare Streamers on Board
				Attachment Height above Water (m)		Total Length (m)		Streamers per Line (No.)		Spacing of Streamers per Line (m)		Length of Streamers (m)		
Subarea 48.3														
Argos Georgia (GBR)	18/5–28/7/00	Sp	N	Y	(6)	N	(120)	Y	(7)	Y	(5)	Y	(1.5–3)	Y
Argos Helena (GBR)	1/5–27/7/00	Sp	N		-		-		-		-		-	Y
Faro de Hercules (CHL)	18/5–27/7/00	Sp	Y		-		-	Y	(15)	Y	(2.5)		-	-
Ibsa Quinto (ESP)	23/4–25/7/00	Sp	N		-	N	(100)		-	Y	(5)		-	-
Illa de Rua (URY)	18/4–25/7/00	Sp	N	Y	(11)	N	(103)	Y	(5)	N	(8)		-	Y
Isla Camila (CHL)	15/4–22/7/00	Sp	Y	Y	(5)	Y	(157)	Y	(6)	Y	(5)		-	-
Isla Gorriti (URY)	18/4–25/7/00	A	N	Y	(11)	N	(125)	Y	(5)	N	(8)		-	Y
Isla Santa Clara (CHL)	12/4–27/7/00	Sp	N	Y	(5)	N	(92)	Y	(42)	Y	(1.06)		-	-
Isla Sofía (CHL)	20/6–28/7/00	Sp	Y	Y	(6)		-		-		-		-	-
Jacqueline (GBR)	30/4–25/7/00	Sp	N	Y	(4.5)	N	(80)	Y	(52)	Y	(1.5)		-	Y
Koryo Maru 11 (ZAF)	1/5–21/7/00	Sp	Y	Y	(8)	Y	(170)	Y	(12)	Y	(5)		-	-
Lyn (GBR)	24/4–25/7/00	Sp	N	Y	(5)	N	(120)		-	y	(3)	Y	(6)	Y
Magallanes III (CHL)	23/4–9/5/00	Sp	N		-		-		-		-		-	-
Magallanes III (CHL)	3/7–5/8/00	Sp	-		-		-		-		-		-	-
No. 1 Moresko (KOR)	26/4–25/7/00	Sp	N	Y	(4.5)	N	(78)	Y	(11)	Y	(2)		-	-
RK-1 (UKR)	25/4–24/7/00	A	Y		-	Y	(250)	Y	(50)	Y	(1.5)		-	-
Tierra del Fuego (CHL)	1/5–21/7/00	Sp	N	Y	(5.5)	N	(70)	Y	(26)	Y	(2.7)		-	-
Subareas 58.6 and 58.7														
Aquatic Pioneer (ZAF)	23/8–5/10/99	Sp	Y		-		-		-		-		-	-
Aquatic Pioneer (ZAF)	9/10–10/12/99	Sp	N	Y	(7)	N	(75)	Y	(6)	Y	(5)		-	Y
Aquatic Pioneer (ZAF)	17/1–18/3/00	Sp	N	Y	(10)	N	(100)	Y	(5)	Y	(5)	Y	(3)	Y
Aquatic Pioneer (ZAF)	29/3–11/5/00	Sp	N	N	(4)	N	(120)	Y	(5)	Y	(5)		-	Y
Aquatic Pioneer (ZAF)	13/7–8/9/00	Sp	N	Y	(7.5)	N	(117)	Y	(6)	Y	(5)	Y	(3)	Y
Eldfisk (ZAF)	26/7–1/10/99	A	N	Y	(5.5)	N	(100)	Y	(9)	Y	(5)		-	Y
Eldfisk (ZAF)	8/10–17/12/99	A	N	Y	(5.5)	N	(80)	Y	(5)	Y	(3)	Y	(1–4)	Y
Eldfisk (ZAF)	5/1–17/300	A	N	Y	(6)	N	(100)	Y	(7)	N	(6)		-	Y
Eldfisk (ZAF)	23/3–2/6/00	A	N	Y	(6)	N	(100)	Y	(7)	Y	(5)		-	Y
Eldfisk (ZAF)	16/6–18/800	A	N	Y	(6)	N	(70)	Y	(9)	Y	(4.8)		-	Y
Koryo Maru 11 (ZAF)	20/8–12/12/99	Sp	N	Y	(5)	N	(100)	Y	(10)	Y	(5)	Y	(2–5)	Y
Koryo Maru 11 (ZAF)	11/17/4/00	Sp	N	Y	(10)	N	(70)	Y	(8)	Y	(4)	Y	(2–5)	Y
Subarea 88.1														
Janas (NZL)	3/1–24/3/00	A	Y	Y	(8)	Y	(200)	Y	(5)	Y	(2)	Y	(4)	Y
San Aotea II (NZL)	8/1–18/3/00	A	Y	Y	(4.5)	Y	(200)	Y	(6)	Y	(5)		-	Y
Sonrisa (NZL)	21/1–7/3/00	A	N	Y	(6)	N	(125)[1]	Y	(5)	Y	(5)	Y	(3.5)	Y
Division 58.4.4														
Isla Alegranza (CHL)	14/7–31/8/00	Sp	N	Y	(4.5)	N	(80)	Y	(7)	Y	(3)		-	-

[1] From electronic forms; the written report to CCAMLR and the New Zealand national observer's report both gave a value of 150 m.

Table 55: Summary of compliance with Conservation Measure 29/XVI regarding night setting, correct configuration and use of streamer lines and offal discharge practices in the Convention Area, from 1998 to 2000. Vessels with a history of non-compliance (at least two consecutive years of non-compliance, including the current year) with a conservation measure are indicated in bold. Vessels in their first year in the fishery that failed to comply with a conservation measure are indicated in italics. Nationality: CHL – Chile, ESP – Spain, GBR – United Kingdom, KOR – Republic of Korea, NZL – New Zealand, PAN – Panama, UKR – Ukraine, URY – Uruguay, ZAF – South Africa; Y – complied, N – did not comply, - did not fish, n/a – not applicable.

Vessel (Nationality)	Subarea/ Division	Night Setting			Streamer Line			Offal Discharge		
		1998	1999	2000	1998	1999	2000	1998	1999	2000
Aquatic Pioneer (ZAF)	58.6, 58.7	Y	N	Y	N	N	**N**	Y	Y	Y
Argos Georgia (GBR)	48.3	-	-	Y	-	-	*N*	-	-	Y
Argos Helena (GBR)	48.3	Y	Y	Y	Y	N	**N**	Y	Y	Y
Cap Kersaint (FRA)	58.6	-	-	Y	-	-	Y	-	-	Y
Croix du Sud I (FRA)	58.6	-	-	Y	-	-	no data	-	-	Y
Eldfisk (PAN)	58.6, 58.7	N	-	-	N	-	-	Y	-	-
Eldfisk (ZAF)	58.6, 58.7	-	N	**N**	-	N	**N**	-	Y	Y
Faro de Hercules (CHL)	48.3	-	-	Y	-	-	Y	-	-	*N*
Ibsa Quinto (ESP)	48.3	-	Y	Y	-	Y	N	-	Y	Y
Illa de Rua (URY)	48.3	N	Y	Y	N	N	**N**	Y	Y	Y
Isla Alegranza (URY)	58.4.4	-	-	**N**	-	-	*N*	-	-	*N*
Isla Camila (CHL)	48.3	Y	N	**N**	N	N	Y	N	N	**N**
Isla Gorriti (URY)	48.3	-	N	**N**	-	N	**N**	-	Y	Y
Isla Santa Clara (CHL)	48.3	-	-	*N*	-	-	*N*	-	-	Y
Isla Sofía (CHL)	48.3	Y	N	Y	N	N	Y	N	N	**N**
Jacqueline (GBR)	48.3	Y	Y	N	N	N	**N**	N	N	**N**
Lyn (GBR)	48.3	-	N	Y	-	N	**N**	Y	Y	Y
Magallanes III (CHL)	48.3	N	N	**N**	N	N	**N**	Y	Y	Y
No. 1 Moresko (KOR)	48.3	-	N	**N**	-	N	**N**	-	Y	Y
RK-1 (UKR)	48.3	-	-	Y	-	-	Y	-	-	Y
Tierra del Fuego (CHL)	48.3	N	N	**N**	N	N	**N**	Y	Y	Y
Janas (NZL)	88.1	-	na	na	-	Y	Y	-	Y	Y
San Aotea (NZL)	88.1	-	na	na	-	Y	Y	-	Y	Y
Sonrisa (NZL)	88.1	-	-	na	-	-	N	-	-	Y
Koryo Maru (ZAF)	58.6, 58.7	Y	Y (Y; 48.3)	N (Y; 48.3)	N	N (Y; 48.3)	N (Y; 48.3)	Y	Y	Y

Table 56: Estimate of seabird by-catch in the unregulated *Dissostichus* spp. fishery in Subareas 48.3, 58.6 and 58.7 and Divisions 58.4.4, 58.5.1 and 58.5.2 in 1999/2000. S – summer, W – winter.

Subarea/ Division	Total Unregulated Catch (tonnes)	Split S:W		Unregulated Catch (tonnes)		*Dissostichus* spp. Regulated By-catch Rate (kg/hooks)	Unregulated Effort (1 000 hooks)		Seabird By-catch Rate (birds/1 000 hooks)				Estimated Total Unregulated Seabird By-catch			
									Mean		Max		Mean		Max	
		S	W	S	W		S	W	S	W	S	W	S	W	S	W
48.3	350	80	20	280	70	0.31	903	226	2.608	0.07	9.31	0.51	2 356	16	8 409	115
	350	70	30	245	105	0.31	790	339	2.608	0.07	9.31	0.51	2 061	24	7 358	173
	350	60	40	210	140	0.31	677	452	2.608	0.07	9.31	0.51	1 767	32	6 307	230
58.6	1 980	80	20	1 584	396	0.09	17 600	4 400	1.049	0.017	1.88	0.07	18 462	75	33 088	308
	1 980	70	30	1 386	594	0.09	15 400	6 600	1.049	0.017	1.88	0.07	16 155	112	28 952	462
	1 980	60	40	1 188	792	0.09	13 200	8 800	1.049	0.017	1.88	0.07	13 847	150	24 816	616
58.7	220	80	20	176	44	0.1	1 760	440	1.049	0.017	1.88	0.07	1 846	7	3 309	31
	220	70	30	154	66	0.1	1 540	660	1.049	0.017	1.88	0.07	1 615	11	2 895	46
	220	60	40	132	88	0.1	1 320	880	1.049	0.017	1.88	0.07	1 385	15	2 482	62
58.4.4	1 050	80	20	840	210	0.24	3 500	875	0.629	0.01	1.128	0.042	2 202	9	3 948	37
	1 050	70	30	735	315	0.24	3 063	1 313	0.629	0.01	1.128	0.042	1 926	13	3 455	55
	1 050	60	40	630	420	0.24	2 625	1 750	0.629	0.01	1.128	0.042	1 651	18	2 961	74
58.5.1	2 100	80	20	1680	420	0.24	7 000	1 750	1.049	0.017	1.88	0.07	7 343	30	13 160	123
	2 100	70	30	1470	630	0.24	6 125	2 625	1.049	0.017	1.88	0.07	6 425	45	11 515	184
	2 100	60	40	1260	840	0.24	5 250	3 500	1.049	0.017	1.88	0.07	5 507	60	9 870	245
58.5.2	800	80	20	640	160	0.24	2 667	667	1.049	0.017	1.88	0.07	2 797	11	5 013	47
	800	70	30	560	240	0.24	2 333	1 000	1.049	0.017	1.88	0.07	2 448	17	4 387	70
	800	60	40	480	320	0.24	2 000	1 333	1.049	0.017	1.88	0.07	2 098	23	3 760	93

Table 57: Estimates of potential seabird by-catch in unregulated longline fishing in the Convention Area in 1999/2000.

Subarea/ Division	Potential By-catch Level	Summer	Winter	Total[1]
48.3	Lower	1 800–2 400	30–30	1 800–2 400
	Higher	6 300–8 400	120–230	6 400–8 600
58.6	Lower	13 800–18 500	70–150	13 900–18 700
	Higher	24 800–33 100	270–540	52 100–33 700
58.7	Lower	1 400–1 800	10–10	1 400–1 800
	Higher	2 500–3 300	30–60	2 500–3 400
58.4.4	Lower	1 700–2 200	10–20	1 700–2 200
	Higher	3 000–3 900	40–70	3 000–4 000
58.5.1	Lower	5 500–7 300	30–60	5 500-7 400
	Higher	9 900–13 200	120–250	10 000–13 500
58.5.2	Lower	2 100–2 800	10–20	2 100–2 800
	Higher	3 800–5 000	50–90	3 900–5 100
Total	Lower	26 300–35 000[1]	150–290[1]	26 000–35 000[2]
	Higher	50 300–66 900[1]	670–1 320[1]	51 000–68 000[2]

[1] Rounded to nearest hundred birds
[2] Rounded to nearest thousand birds

Table 58: Composition of estimated potential by-catch in unregulated longline fisheries in the Convention Area from 1997 to 2000.

Area/Year	Estimated Total Potential Seabird By-catch[1] (lower level above, higher level below)	Composition of Potential Seabird By-catch[2]		
		Albatrosses	Giant Petrels	White-chinned Petrels
Subarea 48.3[3]				
1996/97	-	-	-	-
1997/98	-	-	-	-
1998/99	3 000–4 000	1 505	70	1 680
	12 000–16 000	6 020	280	6 720
1999/2000	1 800–2 400	903	42	1 008
	6 400–8 600	3 225	150	3 600
Subareas 58.6, 58.7[4]				
1996/97	17 000–27 000	4 840	880	13 860
	66 000–107 000	19 030	3 460	54 495
1997/98	9 000–11 000	2 200	400	6 300
	15 000–20 000	3 850	700	11 025
1998/99	13 000–17 000	3 300	600	9 450
	24 000–32 000	6 160	1 120	17 640
1999/2000	15 000–21 000	3 960	720	11 340
	28 000–37 000	7 150	1 300	20 475
Divisions 58.5.1, 58.5.2[4]				
1996/97	-	-	-	-
1997/98	34 000–45 000	8 690	1 580	24 885
	61 000–81 000	15 620	2 840	44 730
1998/99	2 000–3 000	550	100	1 575
	4 000–5 000	990	180	2 835
1999/2000	8 000–10 000	1 980	360	5 670
	14 000–19 000	3 630	660	10 395
Division 58.4.4[4]				
1996/97	-			
1997/98	-			
1998/99	3 000–5 000	880	160	2 520
	4 000–7 000	1 210	220	3 465
1999/2000	2 000	440	80	1 260
	3 000–4 000	770	140	2 205
Total 1996/97	17 000–27 000	4 840	880	13 860
	66 000–107 000	19 030	3 460	54 495
1997/98	43 000–54 000	10 890	1 980	30 185
	76 000–101 000	19 470	3 540	55 755
1998/99	21 000–29 000	6 235	930	15 225
	44 000–59 000	14 380	1 800	30 660
1999/2000	26 000–35 000	7 283	1 202	19 278
	52 000–68 000	14 775	2 250	36 675
Overall Total	104 000–140 000	29 248	4 992	78 548
	237 000–333 000	67 655	11 050	177 585

1 Rounded to nearest thousand birds.
2 Based on averages for lower (above) and higher (below) level values.
3 Based on 43% albatrosses, 2% giant petrels, 48% white-chinned petrels (7% unidentified petrels) (see SC-CAMLR-XVI, Annex 5, Table 44).
4 Based on 22% albatrosses, 4% giant petrels, 63% white-chinned petrels (10% unidentified petrels) (see SC-CAMLR-XVI, Annex 5, Table 42).

Table 59: Summary of IMALF risk level and assessment in relation to proposed new and exploratory longline fisheries in 2000/01.

Area	Risk Scale	IMALF Risk Assessment	Notes
48.1	3	Average risk: Prohibit longline fishing during the breeding season of black-browed and grey-headed albatrosses, southern giant petrel and white-chinned petrel (i.e. September to April). Maintain all elements of Conservation Measure 29/XVI.	• Argentina (CCAMLR-XIX/12) proposes to fish from 1 December to 30 November. This will substantially overlap the recommended season closure. • Directed fishing for finfish in this subarea is currently prohibited under Conservation Measure 72/XVII.
48.2	2	Average-to-low risk: Avoid longline fishing during the breeding season of southern giant petrel (October to March). Maintain all elements of Conservation Measure 29/XVI.	• Argentina (CCAMLR-XIX/12) proposes to fish from 1 December to 30 November. This will substantially overlap the recommended season closure. • Directed fishing for finfish in this subarea is currently prohibited under Conservation Measure 73/XVII.
48.6	2	Average to low risk (southern part of area (south of c. 55°S) of low risk): No obvious need for restriction of longline fishing season. Apply Conservation Measure 29/XVI as a seabird by-catch precautionary measure.	• Argentina (CCAMLR-XIX/12) proposes to fish from 1 March to 31 August north of 60°S and from 15 February to 15 October south of 60°S. This does not conflict with advice provided. • Brazil (CCAMLR-XIX/5) – proposal does not conflict with advice provided. Fishing season to be as established at CCAMLR-XIX. • South Africa (CCAMLR-XIX/6) – proposal does not conflict with advice provided. Fishing season to be as established at CCAMLR-XIX. • Conservation Measure 184/XVIII applied in 1999/2000.
58.4.1	3	Average risk: No specific advice on restriction of fishing season. Apply all elements of Conservation Measure 29/XVI. Much of the risk to seabirds in this area arises in the region of the BANZARE Rise in the west of the region, adjacent to Division 58.4.3.	• Argentina (CCAMLR-XIX/12) proposes to fish from 1 December to 30 November. This does not conflict with advice provided.
58.4.2	2	Average-to-low risk: Prohibit longline fishing during the breeding season of giant petrels (October to March). Maintain all elements of Conservation Measure 29/XVI.	• Argentina (CCAMLR-XIX/12) proposes to fish from 1 December to 30 November. This will substantially overlap the recommended season closure.

(continued)

Table 59 (continued)

Area	Risk Scale	IMALF Risk Assessment	Notes
58.4.3	3	Average risk: Prohibit longline fishing during the breeding season of albatrosses, giant petrels and white-chinned petrels (September to April). Maintain all elements of Conservation Measure 29/XVI.	• Argentina (CCAMLR-XIX/12) proposes to fish from 1 May to 31 August. This does not conflict with advice provided. • France (CCAMLR-XIX/13) – fishing season not specified. • Conservation Measure 187/XVIII applied in 1999/2000.
58.4.4	3	Average risk: Prohibit longline fishing during the main breeding season of albatrosses and petrels (September to April). Maintain all elements of Conservation Measure 29/XVI.	• Argentina (CCAMLR-XIX/12) proposes to fish from 1 May to 31 August. This does not conflict with advice provided. • Brazil (CCAMLR-XIX/5) – proposal does not conflict with advice provide. Fishing season to be as established at CCAMLR-XIX. • France (CCAMLR-XIX/13) – fishing season not specified. • South Africa (CCAMLR-XIX/6) – proposal does not conflict with advice provided. Fishing season to be as established at CCAMLR-XIX. • Ukraine (CCAMLR-XIX/7) proposes to fish from 1 May to 31 August. This does not conflict with advice provided. • Uruguay (CCAMLR-XIX/15) proposes to fish from 1 May to 31 August and comply with Conservation Measure 29/XVI. This does not conflict with advice provided. • Conservation Measure 188/XVIII applied in 1999/2000.
58.5.1	5	High risk: Prohibit longline fishing during the main albatross and petrel breeding season (i.e. September to April). Ensure strict compliance with Conservation Measure 29/XVI.	• Argentina (CCAMLR-XIX/12) proposes to fish from 1 December to 30 November. This will substantially overlap the recommended season closure. • Brazil (CCAMLR-XIX/5) – proposal does not conflict with advice provided. Fishing season to be as established at CCAMLR-XIX. • France (CCAMLR-XIX/13) – fishing season not specified. • Fishing for *Dissostichus* outside EEZs in this division was adjudged unlikely to be viable due to the small amount of fishable ground (SC-CAMLR-XVIII, paragraph 9.50; CCAMLR-XVIII, paragraph 7.23(ii)).
58.5.2	4	Average-to-high risk: Prohibit longline fishing within the breeding season of the main albatross and petrel species (September to April). Ensure strict compliance with Conservation Measure 29/XVI.	• Brazil (CCAMLR-XIX/5) – proposal does not conflict with advice provided. Fishing season to be as established at CCAMLR-XIX. • France (CCAMLR-XIX/13) – fishing season not specified. • Longline fishing is currently prohibited within the EEZ around Heard/McDonald Islands. • Fishing for *Dissostichus* outside EEZs in this division was adjudged unlikely to be viable due to the small amount of fishable ground (SC-CAMLR-XVIII, paragraph 9.50; CCAMLR-XVIII, paragraph 7.23(ii)).

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Table 59 (continued)

Area	Risk Scale	IMALF Risk Assessment	Notes
58.6	5	High risk: Prohibit longline fishing during the main albatross and petrel breeding season (i.e. September to April). Ensure strict compliance with Conservation Measure 29/XVI.	• Argentina (CCAMLR-XIX/12) proposes to fish from 1 May to 31 August. This does not conflict with advice provided. • France (CCAMLR-XIX/13) – fishing season not specified. • South Africa (CCAMLR-XIX/6) – proposal does not conflict with advice provided. Fishing season to be as established at CCAMLR-XIX. • Conservation Measure 189/XVIII applied in 1999/2000.
58.7	5	High risk: Prohibit longline fishing during the main albatross and petrel breeding season (September to April). Ensure strict compliance with Conservation Measure 29/XVI.	• France (CCAMLR-XIX/13) – fishing season not specified. • Directed fishing for *Dissostichus eleginoides* in this subarea is currently prohibited under Conservation Measure 160/XVII.
88.1	3	Average risk overall. Average risk in northern sector (*D. eleginoides* fishery), average to low risk in southern sector (*D. mawsoni* fishery): Longline fishing season limits of uncertain advantage. The provisions of Conservation Measure 29/XVI should be strictly adhered to.	• Argentina (CCAMLR-XIX/12) proposes to fish from 1 December to 31 August and comply with Conservation Measure 29/XVI. This does not conflict with advice provided. • New Zealand (CCAMLR-XIX/17) proposes to fish from 1 December to 31 May, and similarly in the 2001/02 season subject to CCAMLR-XX. Intends to comply with Conservation Measure 29/XVI. Proposes that prohibition on fishing within 10 n miles of Balleny Is, enacted in Conservation Measure 190/XVIII, paragraph 8, should be extended to 50 n miles. Proposes that elsewhere in Subarea 88.1 fishing be prohibited within 10 n miles of coastlines. • New Zealand intends to conduct line-weighting experiments, a condition for an exemption from the application of paragraph 3 (night setting) of Conservation Measure 29/XVI in 1999. • South Africa (CCAMLR-XIX/6) – proposal does not conflict with advice provided. Fishing season to be as established at CCAMLR-XIX. Intends to comply with Conservation Measure 29/XVI, taking into consideration paragraph 9.40 of CCAMLR-XVIII, which defines a fishing season in this subarea from 1 December to 31 August, and gives exemption from the application of paragraph 3 of Conservation Measure 29/XVI. • Uruguay (CCAMLR-XIX/15) proposes to fish from 1 December to 31 August and comply with Conservation Measure 29/XVI. This does not conflict with advice provided. • Conservation Measure 190/XVIII applied in 1999/2000.

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Table 59 (continued)

Area	Risk Scale	IMALF Risk Assessment	Notes
88.2	1	Low risk: No obvious need for restriction of longline fishing season. Apply Conservation Measure 29/XVI as a seabird by-catch precautionary measure.	• Argentina (CCAMLR-XIX/12) proposes to fish from 15 December to 31 August. This does not conflict with advice provided. • South Africa (CCAMLR-XIX/6) – proposal does not conflict with advice provided. Fishing season to be as established at CCAMLR-XIX. • Uruguay (CCAMLR-XIX/15) proposes to fish from 1 December to 31 August and comply with Conservation Measure 29/XVI. This does not conflict with advice provided. • Conservation Measure 191/XVIII applied in 1999/2000.
88.3	1	Low risk: Restrictions on timing of longline fishery probably inappropriate. Apply Conservation Measure 29/XVI, at least until further data on seabird–fishery interactions are available.	• Argentina (CCAMLR-XIX/12) proposes to fish from 1 December to 31 August. This does not conflict with advice provided. • Uruguay (CCAMLR-XIX/15) proposes to fish from 1 December to 31 August and comply with Conservation Measure 29/XVI. This does not conflict with advice provided.